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Bibliography on the Micrometeorology of Snow Cover (Supplement), p. 1009

Vol. 7 August 1956 No. 8

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 7 AUGUST, 1956 No. 8

AGRICULTURE · COMMERCE · AERIAL AND MARINE NAVIGATION · PUBLIC HEALTH · INDUSTRY · ENGINEERING
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1919

SPECIAL FEATURE IN THIS ISSUE

An Annotated Bibliography on the Micrometeorology of Snow Cover (Supplement)

by
Geza Thuronyi, N. T. Zikeev and Malcolm Rigby

Prepared for
U. S. Army Quartermaster Research and Development Center
Enviromental Protection Division

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to ring to the attention of meteorologists current literature in their field and in related fields and provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, c., arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of important references a special subject. No attempt is made to prepare exhaustive bibliographies; instead, the m is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

Atmos. Pollution	2. Aerobiology	3. Cloud Physics	4. Hail
Tornadoes	6. Volcanic Dust	7. Climat. Changes	8. Thunderstorms
Icing	10. Acoust. Propagation	11. Evaporation	

Vol. II, 1951

Extended Forecast.	2. Long Range Forecast.	3. Soil Temp.	4. Constants, etc.
Clim. of Near East	6. Clim. of Middle East	7. Special Winds	8. Radar Storm Detect.
Condensation Trails	10. Clim. of N.E. Africa	11. Mountain Met.	

Vol. III, 1952

Clim. of N.W. Africa	2. Carbon Dioxide	3. Clim. of Argentina, etc.	4. Dew
Objective Forecast.	6. Stratus Forecast.	7. Urban Climatology	8. Clim. of C. Africa
Visibility	10. Glaze and Rime	11. Free Air Turbulence	

Vol. IV, 1953

Turbulence Theory	2. Turbulent Diffusion	3. Frost	4. Clim. of Australia, etc.
High Level Winds	6. Winds in Stratosphere	7. Jet Stream	8. Radiation Bioclim.
Clim. of Pacific	10. Auroras	11. Sferics	

Vol. V, 1954

Oceanog. Met.	2. Clim. of S.E. Asia	3. Auroral Physics	4. Tropopause
Balloons	6. Numerical Forecast.	7. Radiation Data	8. Vertical Motion
Clim. of Arctic	10. Industrial Met.	11. Wind Waves and Swell	

Vol. VI, 1955

1. Bibliog. of Bibliog.	2. Texts & Monogr. Bibliogs.	3. Storm Surges
4. Ionospheric Prop.	5. Photochem.—Upper Atmos.	6. Cloud Physics
7. Radar Cloud Physics	8. Atmos. Nuclei (1841–1950)	9. Atmos. Nuclei (1951–1955)
0. Weather Modification	11. Cooling Power	

Vol. VII, 1956

1. Synoptic Meteorology of the Arctic	5. Atmospheric Radioactivity
2. Climate of Enclosed Spaces	6. Tropospheric Inversions
3. Cosmic Rays in the Atmos. (–1952)	7. Snow Micrometeorology
4. Cosmic Rays in the Atmos. (1953–1956)	8. Snow Micrometeorology (Supplement)

Forthcoming bibliographies will be:

9. Tropical Cyclones, Hurricanes and Typhoons, Vol. 7, No. 9, Sept. 1956
0. Hurricane and Storm Surge Damage, Vol. 7, No. 10, Oct. 1956.

Other bibliographies in preparation are:

Actinometers	*Night Airglow*
Fog Forecasting	*Ozone*
Forest Micrometeorology	*Singularities*
Hurricane Theory	*Solar-Weather Relations*
Microwave Propagation	*Synoptic Aerology*

Part III contains a listing of reviews, and the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue omprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DSG:	U. S. Army Medical Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau, Jahrgang* 2 (Vol. 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

COLLECTED WORKS

7.8–1 551.506.5(798) 551.311.1(798)

†*Miller, Maynard M., ed., [**Juneau Ice Field Research Project of the Dept. of Exploration and Field Research, American Geographical Society. Various of its J.I.R.P. Reports, May 1951–March 1954.**] Contents: Haley, T. R.; Marcus, M. G.; Miller, M. M. and Small, F. A., **Food Reports, Juneau Ice Field Research Project, Alaska, June 1949–Feb. 1951.** *American Geographical Society, J.I.R.P. Report,* No. 3, May **1951.** 39 p. Haley, T. R.; Nicholl, W. and McCollester, D. L., **Medical reports . . . June 1949–Feb. 1951.** *Ibid.,* No. 4, June **1951.** 38 p. Miller, Maynard M. (*ed.*), **Progress Report of logistical operations, 1949, 1950, 1951.** *Ibid.,* No. 5, Oct. **1951.** 45 p. 19 photos. Miller, Maynard M. (*ed.*), **Scientific observations, 1949 field season.** *Ibid.,* No. 6, July **1952.** 163 p. 51 photos, tables, refs. Miller, Maynard M., **Juneau Ice Field Research Project, Alaska, 1950 summer field season.** *Ibid.,* No. 7, Sept. **1954.** 797 p. 16 figs. (some fold.), 10 tables+tables in appendixes, foot-refs., and 48 refs. following p. 97. Miller, Maynard M. (*ed.*), **Juneau Ice Field Research Project, 1951 winter season.** *Ibid.,* No. 8, Dec. **1953.** 51 p. tables, refs. LaChapelle, Edward R., **Snow studies on the Juneau Ice Field.** *Ibid.,* No. 9, March **1954.** 23 figs. (incl. photos), charts (fold.). **DWB**—A small observation station was established in 1949 on a nunatak at 3875 ft elev. overlooking upper Taku Glacier, 16 mi from its terminus. Subsidiary camps were maintained on the ice field (sea level to 6,000 ft). Reconnaissance was carried out for 20 days in 1948, 100 days in 1949, 110 days in 1950 and 32 days in 1951. From 6 (1948) to 31 men (1950) took part. Meteorological, glaciological, ecological, geomorphological and geological studies were made. The 7 reports list equipment, food, medical supplies, experiences, etc. Extensive meteorological, glaciological and micrometeorological observations are included in Reports No. 7 and 8 and some data plus descriptions of meteorological stations and equipment and program in Report No. 6. Observations include standard surface data (wind, temperature, relative humidity, cloudiness, precipitation), ceiling height, visibility, solar and sky radiation, duration of sunshine, snowfall, snow depth, temperature, hardness, density (cores) and chloride content of snow. Maps, photographs of stations, equipment and activities, photostats of original data sheets, profiles, graphs of data, etc. are included in profusion. Finally, a number of recommendations for future expeditions of this type are presented. Glacial movements and ablation rates are carefully determined in order to learn reason for advance of Taku Glacier at same time that other glaciers in area are retreating. Ablation rate is compared graphically with meteorological data and with altitude. Pollen analyses were made in 1950 to see whether such analyses were practicable as a routine observation feature. Hourly sun and sky radiation data are given for summer of 1950 (Eppley pyrheliometer). *Subject Headings:* **1. Meteorological-glaciological expeditions 2. Micrometeorological data 3. Juneau Ice Field Expeditions, 1948–1951 4. Glacial movement bibliographies 5. Global radiation data 6. Expeditions 7. Juneau Ice Field, Alaska 8. Taku Glacier, Alaska. I. American Geographical Society.**—*M.R.*

7.8–2 551.585.55(477)

†Dokuchaev, Vasiliĭ Vasilévich, **Preobrazovanie prirody stepeĭ. Raboty po issledovaniiu pochv i otsenke zemel', uchenie o zonal'nosti i klassifikatsiia pochv, 1888–1900.** [Transformation of the natural conditions of the steppes. Work on soil and land evaluation, studies on the zonality and classification of the soil.] Vol. 6 of his **Sochineniia,** [Collected Works], pub. Moscow, Izdat. Akademii Nauk SSSR, **1951.** 595 p. port., illus., tables, foot-refs., bibliog., p. 535–541. List of charts and maps, with authors, p. 200–204. **DLC**—On page

109–204 is found a summary of the purposes, organization and operations of the famous expedition of the Forestry Dept. of the Ministry of Agriculture to the Steppes of the Ukraine under the leadership of V. V. DOKUCHAEV. The scheme of publication of the scientific results in over 19 separate parts is outlined on p. 162–3. The meteorological results, 1892–1895, edited by N. ADAMOV, are contained in Vol. 3 (3 parts). The other volumes contain material on oro-hydrographic, geological, soil, ground water, geobotanic, phenological (by G. TANFIL'EV), forest culture, agricultural-hydrotechnical and other phases of the complex environment. On p. 173–5 the conclusions reported in the meteorological analysis in Vol. 3 are reviewed. Eight new meteorological stations were set up in a fairly limited area to study the role of the forests in the distribution of the most important meteorological elements in the steppe plateau and river valley areas. Soil temperature, humidity and snow cover are also treated in great detail. It was found that the temperature is quite low and the humidity high in the crowns of trees, especially young trees. Below the crowns the temperature is higher but at the edge of grassy areas the lowest temperature and the highest humidity of all is found. Close to the soil the temperature rises to a maximum at the surface. The denser the forest, the smaller the amplitude of temperature. The difference between dense forest and clearing may be 13°C. The precipitation in the forests and valleys exceeds that on the steppes and the evaporation in the forest is less than in the clearings or steppes (in that relative order). Other conclusions, very important for that early date, are listed (e.g., snow lies on the high steppes one or two weeks longer in spring than it does in the valleys or slopes). On p. 200–204 are listed 60 charts which were compiled from data of this expedition among which are at least 14 pertaining to temperature, wind, snow, precipitation, stations, equipment, etc. (For abstract of meteorological portion, *see* 7.1–36, Jan. 1956, *MAB.*) *Subject Headings:* **1. Soil classification 2. Forest meteorology 3. Steppe climates 4. Ukraine, U.S.S.R.**—*M.R.*

7.8–3 551.510.42:08

Air Pollution Control Association, 48th, Detroit, Michigan, May 23–26, 1955, **Proceedings.** [pub. **1955**?] each section repaged. figs., tables, refs. **DLC**—A number of the 39 papers published in these proceedings are of meteorological interest and have been abstracted and published separately. These are by M. E. SMITH, F. FRENKIEL, H. MOSES and others, and concern theoretical studies of atmospheric diffusion, wind tunnel experiments with models, studies of flow over buildings and behind stacks under various conditions, regional studies (such as at Los Angeles, Detroit, Columbus, Pittsburgh, etc.), studies of effects of locomotives, cigarette-smoke, auto exhaust, organic pollutants, etc. on visibility, health, vegetation, metals, etc. *Subject Heading:* **1. Atmospheric pollution symposia.**—*M.R.*

TEXTBOOKS

7.8–4 551.509(02)

Petterssen, Sverre (*Prof. Met., Chic. Univ.*), **Weather analysis and forecasting.** 2nd ed. Vol. 1, **Motion and motion systems.** N. Y., McGraw-Hill, **1956.** 428 p. tables, numerous figs. and eqs., refs. at end of each ch. **DLC**—The first (1940) edition of PETTERSSEN's text on weather analysis and forecasting by numerical extrapolation and other quantitative or mathematical-graphical methods became a classic overnight. But after 15 years so many new or refined techniques had been introduced as a result of the world-wide networks of upper air stations, high level flying, etc., that the subject has developed faster than books like this could be revised. The present edition is completely reorganized and revised, and even the philosophy of the pedagogy has changed in order to minimize (and if possible) eliminate the difference between what is commonly called synoptic and dynamic meteorology. The work is divided into two volumes—the first and present volume deals with motion systems, the second will deal with analysis and forecasting of weather systems. The 19 chapters of Vol. 1 treat: 1) the basic equations of motion; 2) kinematics of quasi-horizontal motion (streamlines, tajectories, wind field); 3) kinematics of pressure fields; 4) wind in relation to pressure (gradient and geostrophic winds); 5) friction; 6) vertical structure of wind—the jet stream and ionospheric winds; 7) circulation and vorticity; 8) long wave theory; 9) shear and easterly waves; 10) computation of movement of waves and pressure systems; 11) fronts and frontogenesis; 12) structure of cyclones and anticyclones; 13) behavior of cyclones and anticyclones in various parts of the earth—blocking; 14) vertical velocity and divergence; 15) instability theory of

cyclogenesis; 16) development theory; 17) synoptic examples of major storms, secondaries and hurricanes; 18) numerical forecasting; and 19) graphical integrations. Useful tables and nomograms, etc. for computing movements are appended. The first volume of this edition is nearly as large as the entire first edition, and like the latter it contains a good balance between mathematics and graphics—between theory and sound application. (For abstract on 1st ed., *see* C–40, March 1950, *MAB.*) *Subject Headings:* **1. Synoptic-dynamic analysis 2. Analysis and forecasting textbooks.**—*M.R.*

7.8–5 53(02)

Paterson, Grant M. and Cameron, Eugene F., **Science in action, Book 1.** Toronto, J. M. Dent, **1955.** 461 p. figs., photos. **DWB**—Unit 3 on **Weather** (p. 213–271) contains 3 chapters: Ch. 11, Weather—result of atmospheric changes; 12, Air masses and their movements; 13, Weather forecasting. Many fine illustrations are included showing applications of meteorology or observational aspects of interest to the high school student of general (physical) science. *Subject Headings:* **1. Physical science textbooks 2. Elementary meteorology.**—*M.R.*

7.8–6 551.584.7:634.1(213)(02)

†Mohr, Edward Carl Julius (*Univ. of Utrecht*) and Van Baren, F. A. (*Univ. of Indonesia, Bogor, Java*), **Tropical soils: a critical study of soil genesis as related to climate, rock and vegetation.** The Hague, W Van Hoeve, **1954.** 498 p. 102 figs., 143 tables, bibliog. at end of each chapter. **DWB**—This excellent textbook on tropical soils is an outgrowth of Mohr's book which dealt particularly with tropical soils in the Netherlands Indies (published in Dutch in 1933–7, with an English translation, published 1944). The earlier work has been expanded greatly so as to apply to all tropical regions, though examples from the East Indies still are in the majority. Ch. I (p. 17–99) goes extensively into atmospheric climate and its relations to soil climate, and into soil climates. Ch. III (p. 118–132) deals specifically with climate and rock in soil formation in the tropics, and Ch. IV (p. 133–178) with katamorphism (rock weathering) in eleven separate specific areas of the tropics. Comments on the effects of temperature, rainfall and atmospheric constituents on soil formation and behavior are interspersed throughout the book. The treatment is not casual but based on a thorough knowledge of the scientific literature and careful analyses of all available data. A detailed author, geographic and subject index is appended. *Subject Headings:* **1. Soil climatology textbooks 2. Microclimatology textbooks 3. Tropical climatology 4. Netherlands Indies 5. Tropics.**—*M.R.*

7.8–7 551.5(021) 551.311.1 551.578.46

Leet, L. Don (*Harvard Univ.*) and Judson, Sheldon (*Wisc. Univ.*), **Physical geology.** Illus. by Edward A. Schmitz. N. Y., Prentice-Hall, **1954.** 466 p. numerous figs. (incl. photos), tables, foot-refs. **DLC**—The most important chapter of this text for college students beginning the study of geology from the point of view of the meteorologist, is that on glaciation (p. 175–216). The well-illustrated discussion comprises aspects of glaciology, such as: snow formation and accumulation, classification, distribution and nourishment (or ablation) of glaciers; development of glacial theory from J. Venetz (1821) and Jean de Charpentier (1834) to Louis Agassiz (1836–46); extent of glaciation on earth; loess; causes (solar radiation theory of Sir George Simpson), topographic theory and combinations of the tow (solar-topographic); and climatic changes expected in the future. Other pertinent chapters cover the hydrologic cycle, water and wind erosion, dust and sand storms; the oceans; and the origin and age of the earth. *Subject Headings:* **1. Physical geology textbooks 2. Glaciology.**—*M.R.*

MONOGRAPHS AND MANUALS

See also: **Long range temp. waves in Europe** (Røstad), 7.8–158

7.8–8 551.506.9:551.584(435.1)

*Frankenberger, Ernst, **Über vertikale Temperatur-, Feuchte- und Windgradienten in den untersten 7 Dekametern der Atmosphäre, den Vertikalaustausch und den Wärmehaushalt**

an Wiesenboden bei Quickborn/Holstein, 1953/1954. [Vertical temperature, humidity and wind gradients in the lowest 7 dekameters of the atmosphere; the vertical exchange and the soil heat economy of meadows near Quickborn/Holstein, 1953/1954.] *Germany. Deutscher Wetterdienst, Berichte*, 3(2), **1955.** 16 p. 24 figs., 29 tables (some fold.), 11 refs. **DWB DLC**—A continuous series of hourly micrometeorological data for Sept. 1953 through Aug. 1954, for 2, 10, 28 and 70 m above the ground on the Quickborn radio tower located 20 km N. of Hamburg at 53°44′05″N and 09°52′53″E and 12½ m above sea level, is thoroughly analyzed and the results presented in this monograph in extensive tables, diagrams and illustrations. The soil temperature at 2, 5, 10, 20, 50 and 100 cm depth, the evaporation, air temperature and lapse rate, vapor pressure and vapor pressure gradient, wind, insulation and radiation balance are considered. Inversion, fog (64 cases), vertical austauch and water vapor transport, hourly temperature changes, etc. on clear days and nights are calculated. *Subject Headings:* **1. Micrometeorological data analysis 2. Inversions 3. Tower data 4. Quickborn, Germany.**—*M.R.*

7.8–9 550.371:551.594

†Garber, David H., **Study of the earth's electrical field.** Cornell Aeronautical Lab., Inc., Buffalo, N. Y., Contract AF 19(122)467, Final Report, Report No. RA-764-P-15, June 15, **1955.** 159 p. 49 figs., 26 refs., numerous eqs. **DBS**—This is an elaborate and well printed report on 4 years (1951–55) of research and development, including observations during fair weather and foul (from Oct. 1953–April 1954), of the geoelectric field at a site near Buffalo Municipal Airport, N. Y. The field house, equipment, meters, layout circuits, etc. are described and illustrated in detail. Pressure, cloudiness, temperature, humidity, wind speed and direction, precipitation, solar radiation and radioactivity were measured or recorded in addition to the electric potential gradient, atmospheric conductivity and ion count. Analysis of data, including sample records obtained during various types of weather, occupies most of the report. Snowstorms produced marked fluctuations, and rainshowers markedly different field changes, but during the eclipse of June 30, 1954, no significant changes in field were noted. *Subject Heading:* **1. Earth's electric field. I. Chapman, Seville.**—*M.R.*

7.8–10 551.5(033)

Khromov, Sergeĭ Petrovich and Mamontova, L. I., **Meteorologicheskiĭ slovar'.** [Meteorological glossary.] Leningrad, Gidrometeoizdat., **1955.** 454 p. numerous figs., 72 refs. **DLC**—A straightforward glossary consisting of about 4000 terms (words, phrases and a few names) used frequently in meteorological literature, including a number of terms from related fields (mathematics, physics, hydromechanics, astronomy, geography, hydrology) which have frequent applications in meteorology as well as formulas and units of measurement. Geographical places, journals and biographical material are excluded. Most of the definitions are concise, but many are accompanied by clear illustrations (instruments, charts, etc.). Composite terms are in the majority, and all are in dictionary style (not classified or inverted). *Subject Headings:* **1. Meteorological glossaries 2. Russian glossaries.**—*M.R.*

7.8–11 551.501.45:551.577.36(569.4)

Neumann, J., **On the frequency distributions of dry and wet spells at Tel Aviv.** *Israel. Meteorological Service, Ser. A, Meteorological Notes*, No. 14, **1955.** fig., 4 tables, 4 refs., 34 eqs. **DLC.** Repr. from: *Research Council of Israel, Bulletin, Sec. A*, 5(1):28–39, Nov. **1955. DLC**—Frequency distributions of dry and wet spells at Tel Aviv (27 yrs) are analyzed. Probability of persistence of dry spells from one day to the next is about 0.8 for spells of a duration not exceeding 20 days, but is greater for longer spells. Average persistence of a wet spell up to 9 days is about 0.6. The average length of dry spells not exceeding 20 days is 5 days, of wet spells 2½ days. The frequency distribution of wet spells and of comparatively short dry spells is represented by $y=[(1-p)p]e^{\ln p \cdot x}$. The most frequent length of cycles of weather is 5 days. *Subject Headings:* **1. Rainy spells 2. Dry spells 3. Israel.**—*C.E.P.B.*

7.8–12 551.594:551.578.4

†Norinder, Harald and Siksna, Reinhards, **Electric charges measured in the air when blowing snow.** *Arkiv för Geofysik*, Stockholm, 2(14):343–369, **1955.** 19 figs., 5 tables, 20

efs. **DLC**—Snow of different original density was blown into a test room, from which air was moved through a small and large ion counter. It was thus possible to separate individual components of the electric charges: charges of small snow particles and possibly also atmospheric small ions formed by corona discharge from snow particles. A detailed description and sketch of the apparatus are presented. The results are shown in numerous graphs with the number of charge units per cm^3 of air versus time, depending on snow type, voltage, speed and mass of snow. No definite dependence on snow type was found. An attempt was made to explain the test results; but no theory can be established until sufficient experimental evidence is available. Tables give estimated initially formed charges. One test series was made during a wet snowfall, accompanied by appreciable electrical disturbances. *Subject Headings:* **1. Snow electricity 2. Blowing snow 3. Atmospheric electricity.**—*A.A.*

7.8–13 551.524.3:551.571.3(411)

*Thomson, A. B., **Distribution of wet-bulb temperature at Aberdeen and Eskdalemuir.** *Great Britain. Meteorological Office, Professional Notes,* No. 120, **1956.** 26 p. 6 figs., 6 tables, 4 refs. At head of t.p.M.O.524t. **DWB**—Means of dry bulb, wet bulb and relative humidity are given for each month, 1938–47 at Aberdeen and 1940–49 at Eskdalemuir. Frequency tables of wet-bulb for each hour, month and season are tabulated and a Pearson frequency curve is fitted to the annual totals. Standard deviations and cumulative totals of 24 hourly means and 9 h values are given. The figures are compared with those for Glasgow and Kew Observatory. *Subject Headings:* **1. Wet bulb temperatures 2. Aberdeen, Scotland 3. Eskdalemuir, Scotland.**—*C.E.P.B.*

GENERAL GEOPHYSICS AND METEOROLOGY

EXPEDITIONS (ARCTIC, ANTARCTIC)

See also: **Juneau Ice Field Res. Project** (Miller), 7.8–1; **Trans-Antarctic Exped., 1955–1958** (Stewart), 7.8–16; **Glaciology of Antarctic** (Loewe), 7.8–220.

7.8–14 523.78:551.506.5

*Shorey, Russell R., **Operational history of the 30 June 1954 USAF Solar Eclipse Project.** American Geographical Society, Contract AF 19(604)-826, Final Report, Oct. **1954.** 72 p. diagrs. Appendix: Keegan, Thomas J., **Climatological analysis of weather conditions along the path of the solar eclipse of 30 June 1953** (*sic*!). **MH-BH**—The planning details that went into this eclipse observation project are set forth in a systematic manner. Selection of sites was made on the basis of cloud and visibility data (analysis shown in Appendix for 13 stations from the Great Lakes across Quebec and Iceland to Norway and Sweden). Reconnaissance teams visited sites in the various countries, receiving excellent cooperation. The American Geographical Society prepared guide books for each site including, among other information, descriptions of local climatic conditions such as humidity, dust, fog, wind and temperature. *Subject Headings:* **1. Eclipse expeditions 2. Expedition planning 3. Eclipse climatic data 4. North Atlantic area. I. Keegan, Thomas J.**—*M.R.*

7.8–15 551.5:908(99)

†Slaucitajs, Leonidis, **Aktivität Argentiniens in Antarktisforschung.** [Activities of Argentina in Antarctic research.] *Geofisica Pura e Applicata,* Milan, 29:226–229, Sept./Dec. **1954.** table, 26 refs. **DLC**—History of Antarctic research activities of Argentina is outlined with emphasis on the increased activity of recent years. Antarctic meteorological observations have been made since 1902. The 26 references, mostly books, are exclusively to Argentina Antarctic literature. Available maps of Antarctic regions are also listed. *Subject Headings:* **1. Antarctic research 2. Antarctic bibliographies 3. Antarctica 4. Argentina.** —*G.T.*

7.8–16 551.506.5(99)

Stewart, R. H. A., **Trans-Antarctic expedition, 1955–58.** *Meteorological Magazine,* London, 85(1005):78–79, March 1956. **DWB**—Article, reprinted from **The Times,** London,

describing plans for observations, including upper air, at Vahsel Bay (78°S, 35°W) and 300 m inland at 8000 ft. *Subject Heading:* **1. Antarctic expeditions.**—*C.E.P.B.*

IGY, WMO

7.8–17 551.5:0

Béll, Béla, **A Meteorológiai Világszervezet II. kongresszusa Genfben: 1955. április 14–május 13.** [Second meeting of WMO at Geneva, April 14–May 13, 1955.] *Időjárás*, Budapest, 59(3):170–176, May/June **1955.** 6 photos. **DWB, DLC.** Also: Perović, M., **Svetska Meteorološka Organizacija, II kongres orgánizacije.** [World Meteorological Organization 2nd meeting.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 4(3/4):75–79, July/Dec. **1955.** Also: Petrovič, Š. and Vesecký, A., **II. Kongres Svetovej meteorologickej organizácie Zeneve v dňoch 14. Apríla až 13. mája 1955.** [Second meeting of WMO, April 14–May 13, 1955.] *Meteorologické Zprávy*, Prague, 8(5):114–117, **1955.** 2 photos. **DWB**—Account of the resolutions passed by the 1955 meeting of WMO. The resolutions include: 1) acceptance of the UNESCO program for investigating warm humid climates; 2) the UNO Economic and Social Council's hydroelectric project; 3) work on a climatic atlas of the world; 4) publication of monthly climatic data of the world; 5) continuation of the work of the 8 technical committees; 6) adoption of a manual containing 12 chapters of instructions aimed at establishing international standards in meteorological work; and 7) the WMO technical program for the coming 4 years. *Subject Heading:* **1. World Meteorological Organization, Congresses.**—*G.T.*

7.8–18 550.3:061.

Odishaw, Hugh, **International Geophysical Year symbol.** *Science*, 123(3200):722, April 27, **1956.** Also: **Symbol for the International Geophysical Year.** *Nature*, London, 177(4508):559–560, March 24, **1956.** 2 figs. **DWB**—The two "global" symbols to be used on CSAGI and other IGY publications and on instruments, equipment, etc. used for IGY are illustrated and described. The design suggests a solar-terrestrial relationship, a satellite orbit, and emphasis on the Antarctic. *Subject Headings:* **1. International Geophysical Year, 1957–1958 2. IGY symbol.**—*C.E.P.B.*

7.8–19 551.5:0

Rivet, J. R., **First Session of Regional Association for Asia held before Congress.** *World Meteorological Organization, WMO Bulletin*, 4(2):60–65, April **1955. DWB**—Presents minutes of the session in New Delhi on the premises of the Indian Meteorological Service from Feb. 2–14, 1955 which was attended by representatives of Burma, Hong Kong, India, Iraq, Japan, Pakistan, Thailand and the U.S.S.R., and by observers from other countries and UN institutions. The program of working committees set up one for questions concerning instruments, observations, networks, climatology and publications, and another for codes and transmissions. The latter is discussed in greater detail. A photo of participants is presented. *Subject Heading:* **1. WMO. Regional Association II meetings.**—*A.M.P.*

SERVICES

See also: **Mannheim Met. Soc.** (Seydl), 7.8–26; **Agromet. activity in W. Germany and France** (Ratković), 7.8–49.

7.8–20 551.501.9:01

†**Rapport de la Section de Météorologie (Espagne).** [Report of the Spanish Section of Meteorology.] *International Union of Geodesy and Geophysics, Bulletin d'Information* 3(6):241–243, July **1954.** bibliog. p. 242–243. **DWB**—The network of stations in Spain has been increased so that there are now 3 sferics stations, 15 regional forecast centers, 11 synoptic or climatic (1st order) stations, 530 second order, and 2,500 rainfall stations as well as a number of wind recording stations for wind power utilization studies. An alphabetical author list of 50 works published by meteorologists in Spain during 1951–4 is appended. *Subject Headings:* **1. Meteorological networks 2. Bibliography of Spanish meteorological literature.**—*M.R.*

SOCIETIES—CONFERENCES

See also: **Mannheim Met. Soc.** (Seydl), 7.8–26; **Symposium on atmospheric control,** 7.8–3; **Symposium on solar energy, wind power,** 7.8–47; **Hydrologic conferences** (Przedpełska), 7.8–215.

7.8–21 551.5:061.2(411)(09)

Centenary of the former Scottish Meteorological Society. *Nature*, London, 177(4504): 371–372, Feb. 25, **1956. DWB**—Summary of article in *Weather*, 10(11):363 367, Nov. 1955 (*see* 7.3–38, March 1956, *MAB*), by Sir Ernest Wedderburn. *Subject Heading:* **1. Scottish Meteorological Society.**—*C.E.P.B.*

7.8–22 91:06 551.58

Berg, Lev Semenovich, **Vsesoiuznoe geograficheskoe obshchestvo za sto let.** [The Russian Geographical Society on its 100th birthday.] Moscow, Izdat. Akademii Nauk SSSR, **1946.** 260 p. ports., photos., illus., numerous refs. List of publications of the Society, p. 249–252. **Klimatologiia,** [Climatology], p. 138–143. Price: 24 rub. **DLC**—The author presents a detailed history of the founding and activities of the Russian Geographical Society during its first hundred years. In addition to sponsoring exploration in Asiatic Russia, the Pacific Islands, work in ethnography, historical geography, etc., the society played an important rôle in the development of climatology. The society published the *Repertorium für Meteorologie*, organized a meteorological committee under the chairmanship of H. I. Wild and sponsored the important climatological studies of A. I. Voeĭkov. *Subject Headings:* **1. Russian Geographical Society 2. Climatological research 3. U.S.R.R.**—*I.L.D.*

7.8–23 5:06 551.5:06

Primer Congreso Interuniversitario Nacional de Matemática, Física, Meteorología y Geología. [The first Inter-University Congress of Mathematics, Physics, Meteorology and Geology.] *Meteoros*, Buenos Aires, 4(4):399–403, Oct./Dec. **1954.** Also, p. 259–260, Editorial [with the same title]. **DWB**—About 25 papers read in seminars of the subcommission section of meteorology are listed. Official "themes" were "applied meteorology and climatology," "synoptic meteorology and hydrometeorology" and "physics and dynamics of the atmosphere." *Subject Headings:* **1. Meteorology 2. Applied climatology 3. Meteorological conferences 4. Inter-University Congress of Mathematics, Physics, Meteorology and Geology.**—*M.R.*

EDUCATION, HISTORY AND BIOGRAPHY

EDUCATION

7.8–24 551.5:37

Montgomery, Herbert (*New Castle, Ind.*), **A camp weather station.** *Weatherwise*, 7(5): 121–122, Oct. **1954.** photo. **DWB**—Interest in weather science is developed by participation in weather observations and trial forecasts made by sixth graders during the school camp session. *Subject Headings:* **1. Teaching of meteorology 2. New Castle, Ind.**—*A.A.*

7.8–25 551.5:6

Senter, William O. (*U. S. A.F.*) **Air Force weather careers.** *Weatherwise*, 6(5):122–123, Oct. **1953.** illus. **DWB**—Basic training, observers courses, technicians courses (meteorological and climatological) and other phases of the career of an enlisted airman, and similar training and assignments of commissioned personnel of the U. S. Air Force, and the varied opportunities in the Air Weather Service with its 238 stations scattered throughout the world are described. Forecasting, briefing, instrument work, weather reconnaissance flights, climatological studies for planning and research, analyses, observing and administrative work are among the activities enumerated. *Subject Headings:* **1. Careers in meteorology 2. U. S. Air Weather Service.**—*M.R.*

HISTORY

See also: **Russian Geog. Soc.** (Berg), 7.8–22; **Development of phenology in Gt. Brit.** (Uhlig), 7.8–64; **Historic auroras** (Seydl), 7.8–270.

7.8–26 551.5:061(09)

Seydl, Otto, **Mannheimská společnost meteorologická, 1780–1799.** [The Mannheim Meteorological Society, 1780–1799.] *Meteorologické Zprávy*, Prague, 7(1):4–11, Feb. **1954.** figs., 3 refs. **DLC**—The history of the Mannheim Meteorological Society is outlined (according to Traumuller). This society was founded in 1780 as a department of the Mannheim Academy of Science, and was in active operation for some 15 years. Meteorological observations were collected from the principal scientific centers of Europe (equipped by the Society) and from a station in Greenland and two in North America. Results were published in 13 volumes of **Ephemerides** (1780–1795) covering close to 7,000 pages. Summaries of these volumes are included. In addition to extensive data the **Ephemerides** contain descriptions of instruments and instructions for making observations by uniform methods as well as deductions made from a large variety of meteorological observations. *Subject Headings:* **1. History of meteorological organizations 2. Mannheim Meteorological Society.**—*G.T.*

7.8–27 551.506.3(42)(09)

†Manley, Gordon, **Constantia Orlebar's weather book, 1786–1808.** *Royal Meteorological Society, Quarterly Journal*, 81(350):622–625, Oct. **1955.** 3 tables. **DWB**—Some typical entries from a journal at Ecton (52°15′N, 1°48′W) and frequencies of snow or sleet and thunder, compared with other contemporary and recent records. *Subject Headings:* **1. Historic weather records 2. Ecton, England. I. Orlebar, Constantia.**—*C.E.P.B.*

BIOGRAPHY

7.8–28 551.5:92

Ehmert, A. and Schopper, E., **In Memoriam Erich Regener † 27. Februar 1955.** *Naturwissenschaften*, 43(4):69–71, Feb. **1956. DWB**—Born Nov. 12, 1881, at Bromberg. In 1905, his doctoral thesis **On the effect of short wave radiation on gases** discussed oxygen-ozone equilibrium in UV solar radiation, a problem to which he returned at intervals throughout his life. In 1909, he determined the elementary electric charge. At the end of the 1920's, he began investigating cosmic ultraradiation from deep under water to high in the stratosphere, using special balloon techniques. He also investigated freezing of water vapor at temperatures of −72°C. *Subject Headings:* **1. Obituaries 2. Regener, Erich.**

7.8–29 551.5:92

Three score years and ten. *Weather*, 11(3):facing p. 71, March **1956.** fig. **DWB**—Note on the work of Sir Geoffrey Taylor on hydrodynamics and turbulence. He was 70 in March 1956 and is still active. *Subject Headings:* **1. Biography 2. Taylor, Sir Geoffrey.**—*C.E.P.B.*

BIBLIOGRAPHY AND TERMINOLOGY

See also: **Russian met. glossary** (Khromov), 7.8–10; **Antarctic bibliographies** (Slaucitajs), 7.8–15.

7.8–30 91:04:016(99)

†Brase, Will Augusto Hermann, **International Antarctic bibliography.** Brunswick, **1954.** unpaged. additional t-pages in Spanish and German. Author, subject and place in one listing. This piece comprises Adélie Land through Herzog-York-Island. **DLC**—Dictionary arrangement (A-H) of over 300 titles from earliest times to 1954, from 65 libraries in different countries. Covers all literature on Antarctic, but largely newspaper accounts of expeditions. *Subject Heading:* **1. Antarctic bibliographies.**—*M.R.*

APPLIED METEOROLOGY

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Tests of Friez Aero-Vane on shipboard** (Kawano, Watanabe), 7.8–70; **Change of rotational speed of cup anemometer for marine use** (Sanuki, Kimura), 7.8–71; **Periodical sea temp. variations** (Schweigger), 7.8–168; **Wind currents in the Straits of Dover** (Bowden), 7.8–178.

7.8–31 551.464:551.577

Ichiye, Takashi (*Kobe Marine Obs.*), **On the change of density of the coastal water due to the precipitation.** *Japan. Central Meteorological Observatory, Tokyo, Oceanographical Report*, 3(3):73–79, July 1954. 3 figs., 2 tables, 4 refs. In Japanese; English summary, p. 73. **DWB**—When the change of the density of the coastal water is expressed by the equation $\partial S/\partial t = -k(S-S_0)+F(t)$, the relation between k and the vertical mixing is discussed for the simple model of the mixing of waters. The values of k and the effect of the precipitation on the decrease of the density are determined by the method of least squares from the data in 1950, which give reasonable result only when precipitation does not occur successively. The types of the density decrease due to precipitation are divided in classes, one of which is observed at the stations on the coast of the open sea, the other of which is in the Inland Sea. The decrease of the density is closely related with precipitation of the former type and the proportionality between the density decrease and precipitation is less at the stations of abundant rainfalls, whereas precipitation seems to affect the density only indirectly for the latter station. *Subject Headings:* **1. Sea water density 2. Precipitation effects.**—*Author's abstract.*

7.8–32 551.461.2:525.63:532.596

Proudman, J., **The propagation of tide and surge in an estuary.** *Royal Society of London, Proceedings, Ser. A*, 231(1184):8–24, July 19, 1955. 3 refs., 66 eqs. **DWB**—In studying problems of coastal flooding, it is calculated that for a single progressive surge generated over the open sea the height in an estuary at tidal high water is less than at tidal low water, and decreases as the range of the tide increases. For a standing wave, at high tide at the head of an estuary, the effect of shallow water is to increase the surge as the range of the tide increases, but friction decreases the surge. In the Thames estuary these tendencies apply as far as London. *Subject Heading:* **1. Tidal floods.**—*C.E.P.B.*

7.8–33 551.465:532.593:551.515

Rodewald, M., **Die Gewalt eines Brechers.** [The power of a breaker.] *Wetterlotse*, Hamburg, No. 97:26–29, Feb. 1956. fig. **DLC**—In a N.E. storm in Denmark Strait (Beaufort 10–11, 12 in squalls) the "Gesine Müller" was struck in the side by a large breaker, causing great damage. A heavy list resulted from the shifting of the coal (nuts instead of the usual bunker coal). The storm was due to a rapid pressure fall followed by a rise, coming from the N.W. *Subject Headings:* **1. Wave damage 2. Storm waves 3. Denmark Strait.**—*C.E.P.B.*

7.8–34 621.396.93:629.13

Rodewald, M., **Pionierfahrt der "ITALIA" im Elbnebel.** [Pioneer voyage of the "Italia" in Elbe fog.] *Wetterlotse*, Hamburg, No. 97:24–26, Feb. 1956. **DLC**—Account of a blind voyage from "Elbe 1" to Hamburg in 12 hrs, with the help of ship's and land radar. *Subject Heading:* **1. Radar aids to navigation.**—*C.E.P.B.*

7.8–35 532.59:551.468

Wiegel, R. L. and Fuchs, R. A. (*Wave Research Lab., Univ. Calif.*), **Wave transformation in shoaling water.** *American Geophysical Union, Transactions*, 36(6):975–984, Dec. 1955. 5 figs., 2 tables, 8 refs., 4 eqs. **DWB, DLC**—A series of wave recorders was installed from the surf zone to a point nearly a mile offshore, to study the transformation of waves in shoaling water. Examples of data taken by the recorders are presented, and the records are correlated with one another. The theory for waves traveling in shoaling water is given, and a table is presented for use in predicting the theoretical travel time for periodic waves on beaches of small constant slope. From the data obtained, it appears that under favorable circum-

stances wave records obtained in water as deep as 81 ft (below MLLW) could be correlated with records obtained in the vicinity of the surf zone in 12 ft of water, the recorders being located nearly 4200 ft apart. Travel time is predicted quite well by theory. *Subject Headings:* **1. Ocean wave propagation 2. Coastal waves.**—*Authors' abstract.*

GLACIER ICE AND SEA ICE

See also: **Juneau Ice Field Project** (Miller), 7.8–1; **Temp. of Greenland Ice Cap** (Wegener), 7.8–166; **Antarctic glaciology** (Loewe), 7.8–220; **Glacial activity in western U. S.** (Harrison), 7.8–229; **Glaciers of the Washington Cascade & Olympic Mts.** (Hubley), 7.8–230; **Retreat of East Alpine glaciers** (Förtsch, Vidal), 7.8–231; **Fluctuations of the Nisqually glacier** (Harrison), 7.8–232; **Rakhiot Glacier** (Pillewizer), 7.8–233; **Glacier fluctuations, West Spitzbergen** (Sweeting, Groom), 7.8–234.

7.8–36 551.311.

Haefeli, R. and Brentani, F., **Observations in a cold ice cap, Pt. 1.** *Journal of Glaciology*, 2(18):571–580, Oct. 1955. 10 figs., table, 7 refs., eq. English and German summaries p. 571. **Pt. 2.** *Ibid.*, 2(19):623–630, March 1956. **DWB**—In Pt. 1 observations of plastic distortion, movement and structure in a 130 m tunnel and side tunnels in the 50 m thick ice cap on Jungfraujoch are described. Pt. 2 discusses stress, temperature and viscosity in an Alpine ice cap, and compares them to conditions in the Greenland ice sheet. *Subject Headings:* **1. Glaciology 2. Jungfraujoch, Switzerland.**—*C.E.P.B.*

7.8–37 551.311.1

Nusser, Franz, **Problems of sea ice research.** *Journal of Glaciology*, London, 2(19):619–623, March 1956. 6 refs. English and German abstracts, p. 619. **DWB**—Research on sea ice lags behind that on glacier ice, though of great practical importance. Ice services collect and sift information but working up is incomplete. Several ice atlases have been published and a classification of types of ice cover has been started; it is hampered by the lack of a uniform terminology. The time is ripe for a transition from geographical to geophysical working methods, which can result in ice forecasts. *Subject Heading:* **1. Sea ice research.**—*C.E.P.B.*

7.8–38 551.311.12

Galloway, R. W., **Mechanical measurement of glacier motion.** *Journal of Glaciology*, London, 2(19):642–644, March 1956. 4 figs., 9 refs. **DWB**—A device is illustrated in which a wire passes from a fixed point on the bank round a pulley on a drum fixed in the ice and back to another point on the bank. The movement of the ice causes the drum to rotate and a pen operated by clockwork traces out the movement. *Subject Heading:* **1. Glacier movement measurement.**—*C.E.P.B.*

7.8–39 551.311.17(987)

Mercer, J. H., **The Grinnell and Terra Nivea ice caps, Baffin Island.** *Journal of Glaciology*, London, 2(19):653–656, March 1956. 6 figs., 5 refs. English and German summaries p. 653. **DWB**—The southernmost ice caps and glaciers are described. Most are retreating slightly but the largest glacier is advancing. The economy of the Grinnell ice cap is discussed. *Subject Headings:* **1. Baffin Island ice cap 2. Baffin Island.**—*C.E.P.B.*

7.8–40 551.521:551.525:551.584.34

Ambach, W., **Über den nächtlichen Wärmeumsatz der gefrorenen Gletscheroberfläche.** [On the nocturnal heat exchange of the frozen glacier surface.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 3(2):247–248, 1956. 2 tables, ref. **DLC**—Summary of paper in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 8(4):411–426, 1955. For abstract of original, *see* 7.2–146, Feb. 1956, *M.I.B.* *Subject Headings:* **1. Ice temperatures 2. Glacier heat balance 3. Nocturnal temperature inversion.**—*C.E.P.B.*

7.8–41 551.311.17

Robin, G. de Q., **Determination of the thickness of ice shelves by seismic shooting methods.** *Nature*, London, 177(4508):584–586, March 24, 1956. fig., 2 tables, 4 refs. **DWB**

—A new interpretation of [illegible] ice shelf thickness is discussed. A profile near [illegible] with 'ice hills' where there is insufficient water to [illegible] 1. Shelf ice thickness 2. Seismic ice measurement 3. Antarctica.—*C.E.P.B.*

AERONAUTICAL METEOROLOGY

See also: Speed correction coefficients of aircraft thermometers (Durbin), 7.8–164; Gusts and their measurement (Taylor), 7.8–175; Aerial spraying in East Africa (Thompson), 7.8–176.

7.8–42 551.577.61:656.7

British study raindrop damage. [illegible] Weather Bur., Wash., D. C., 68 9):137, Aug. 27, 1955. DLC—The British have found a new way to test materials to be used for the exteriors of high-speed planes without actually flying test planes. They fire a projectile of the exterior aircraft material at a single drop of water suspended on a web from an air pressure gun, at speeds up to 800 mph. Air pushed forward by the projectile blows the web out of the way so that only the drop hits the projectile. The head of the projectile, where the drop struck, can then be examined for damage. See *Sci. News Lett.*, Aug. 13, 1955, article by D. C. Jenkins. *Subject Headings:* 1. Raindrop damage 2. Impingement of drops 3. Laboratory experiments. —*A.M.P.*

7.8–43 551.551:629.13

Plane "snaking" can be caused by air turbulence. *Science News Letter*, 68 (2):19, July 9, 1955. DLC—Brief note on wind tunnel tests at NACA, Langley Field, Va. which indicates that atmospheric turbulence may be responsible for the puzzling nuisance known to pilots as "snaking." This wobbling decreases the accuracy of aerial guns. *Subject Headings:* 1. Turbulence effects 2. Airplane performance.—*W.N.*

7.8–44 551.58:620.19

Dummer, G. W. A.; Scholar, S. C. and Green, J. E. Pan-climatic testing. Reassessment of requirements for service equipment. *Wireless World*, London, 44:598–600, Dec. 1954. 3 figs., 3 tables. DLC—Description of the testing equipment available for aircraft equipment and of faults found. The standard climatic extremes are: desert, tropical damp heat, arctic, high altitude (30–40,000 ft) and sea. *Subject Headings:* 1. Climatic testing equipment 2. Aeronautical meteorology.—*C.E.P.B.*

INDUSTRIAL METEOROLOGY

7.8–45 551.586:615.8

Magos, Ljudo. Mikroklima és munkaegészségügy. [Microclimate and industrial hygiene.] *Munkavédelem és Társadalombiztosítás*, Budapest, 1950, 12:738–744, Dec. 1950. 7 figs., 2 tables. DLC—The effect of temperature, humidity and air motion on the heat balance of the human body is analysed. The measuring problems and results of climatic comfort research (katathermometer, effective temperature concept, subjective and objective physiological surveys) are reviewed. *Subject Headings:* 1. Climatic comfort.—*J.T.*

7.8–46 551.571:677

Cassie, A. B. D. Physics and textiles. *Physical Society of London, Reports on the Progress of Physics*, 10(1944–45):179–194, 1946. 10 figs., 6 tables, 75 refs., 41 eqs. DLC—Includes a discussion of thermal properties of textiles, especially wool. Conductivity of wool felts increases from about 1 [illegible] °C cm^{-1} at bulk density 0.1 gm/cc to about 3 at 1 gm. Equilibrium moisture relations and regain of various textiles at R.H. 0–100% are plotted. The heat of absorption of water vapor by wool is much greater than the specific heat of wool; a man [illegible] from 15% at 18°C to 95% at 5°C will evolve as much heat as his body normally [illegible]. Other subjects discussed are rate of propagation of temperature change [illegible] swelling of wool by absorption of water,

diffusion of water through horn, and water-repellency of textiles. *Subject Headings:* **1. Humidity effects 2. Textiles.**—*C.E.P.B.*

7.8–47 620.9:551.521.1 621.311.24

Symposium on solar energy and wind power. *Journal of Scientific and Industrial Research*, New Delhi, 13A(12):555–557, Dec. **1954. DLC**—Summaries are presented of some of the papers delivered at the Symposium on Solar Energy and Wind Power, sponsored by UNESCO, held at New Delhi from Oct. 22 to 26, 1954. The papers by D. DRESDEN on wind power utilization, by FARRINGTON DANIELS on solar energy are summarized together with the comments of various participants. *Subject Headings:* **1. Solar energy utilization 2. Wind power 3. Symposia.**—*I.L.D.*

MEDICAL METEOROLOGY

See: **Influence of weather on mortality** (Hisdale), 7.8–243; **Acute myocardial infarction during summer months** (Heyer et al.), 7.8–244; **Effect of weather on asthma** (Markow, Reicher), 7.8–245; **Poliomyelitis and warm weather** (Topitz), 7.8–246.

AGRICULTURAL METEOROLOGY

See also: **Occurrence of phenological phases . . .** (Seyfert), 7.8–62; **Heat balance of wheat field** (Kirillova), 7.8–163; **Effect of rainfall on soil and water losses in N.W. Arkansas** (Bartholomew et al.), 7.8–214; **Body temp. of calves** (Bligh), 7.8–242; **Rice culture, Japan** (Sato), 7.8–248; **Orchard spraying** (de Villiers), 7.8–249.

7.8–48 551.524.37:632.111.3

Firth, H. J. (*Irrigation Res. Station Griffith, C.S.I.R.O., N.S.W.*), **Trials of wind machine for frost protection in citrus.** *Australian Journal of Agricultural Research*, Melbourne, 6(6): 903–912, Nov. **1955.** 5 figs., 2 tables, 4 refs. **DWB**—A large horizontal axis wind machine for prevention of frost damage, built in Australia, has been tested during 1950–52 under local conditions at Griffith, N.S.W. in a citrus grove. It was shown to be effective in raising orchard temperature by 2°F within 10 min over an area of up to 10 acres and 2°–8° in a smaller area at a power expenditure of 12 hp. (assuming >0% efficiency = 8 hp.) per acre, which is comparable to results obtained with similar machines in California (5–10 hp.) and with the low speed Australian type (8 hp.) of wind machine. Temperature curves at a number of thermistor stations, and isotherms during a frost in July 11/12, 1953 are shown. Zone of effect is somewhat distorted by natural airflow in orchard. Angle of tilting of fan affects area up to a tilt of 7°, but from 7° to 20° there is no effect. *Subject Headings:* **1. Frost fans 2. Frost protection of orchards 3. Griffith, N.S. Wales.**—*M.R.* and *author's abstract.*

7.8–49 551.5:63:06

Ratković, B., **Agrometeorološka aktivnost u Zapadnoj Nemačkoj i Francuskoj.** [Agrometeorological activity in West Germany and France, Pt. 1.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 4(1/2):7–14, Jan./June **1955.** Pt. 2, *Ibid.*, 4(3/4):79–87, Jan./Dec. **1955. DWB**—The author visited a number of agrometeorological and bioclimatological stations and centers in Germany and France and gives, in considerable detail, an account of his findings concerning the organizational set-up of the German and French agrometeorological and phenological networks and their observation and research work, publications and various services. *Subject Headings:* **1. Agrometeorological services 2. West Germany 3. France.**—*G.T.*

7.8–50 631:551.5(47)

Sinel'shchikov, V. V., **Nauka—v pomoshch' osvoeniiu tseliny.** [Science in the aid of the utilization of virgin lands.] *Meteorologiia i Gidrologiia*, Moscow, No. 3:64, May/June **1955. DWB**—The report of a meeting held at the Academy of Science of the U.S.S.R. on the role of science in the utilization of virgin and fallow lands. The scientific associations participating in this meeting are listed. Representatives of the hydrometeorological service delivered

papers on moisture requirements of spring wheat in the virgin and fallow lands, agroclimatic resources of Kazakhstan, etc. *Subject Headings:* **1. Agricultural meteorology 2. Agronomy 3. U.S.S.R.**—*I.L.D.*

FOREST METEOROLOGY

See: **Forest meteorology** (Dokuchaev), 7.8–2; **Aircraft applications of insecticides—turbulence in woodland** (Thompson), 7.8–176.

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Dry and wet spell frequency, Tel Aviv** (Neumann), 7.8–11; **Rept. Spanish Sect. of Met,** 7.8–20; **Radiation balance calculation** (Ridel'), 7.8–68; **Frost point measurem. in stratosphere,** 7.8–73; **Practical evaluation of solar energy** (Buscaglia), 7.8–149; **Determination of horizontal velocity of ionospheric movements** (Chapell, Henderson), 7.8–181; **Radar-echo duration and height of Perseid meteor** (McKinley), 7.8–252.

7.8–51 551.501.42:551.577

Schneider-Carius, K., **Die statistische Begründung der Regel zur Reduktion von Niederschlagsreihen.** [The statistical basis of the rule for reduction of rainfall series.] *Zeitschrift für Meteorologie,* 9(10):301–302, Oct. **1955.** 5 refs. **DLC**—HANN's quotient rule for the reduction of one rainfall series to another is justified by the logarithmic frequency distribution. *Subject Heading:* **1. Rainfall computation.**—*C.E.P.B.*

7.8–52 551.501.42:551.508.41

Teddington, England. National Physical Laboratory, **Conventions associated with mercury barometers in British practice.** Teddington, **1945.** 21 p. Mimeo. **GB-MO**—This is of historical interest. The conventions and systems of graduation of inch, mm and mb barometers are described and their disadvantages listed. Proposals are the adoption of a common temperature of 20°C as the basis of all scales and the adoption of a single gravity standard (to be investigated). An appendix gives practical considerations in changing to a new scheme. *Subject Heading:* **1. Barometer graduation.**—*C.E.P.B.*

7.8–53 551.501.6:551.55

Pinna, Mario, **Una nuova rappresentazione grafica dei dati anemometrici.** [New graphic presentation of wind data.] *Società Geografica Italiana, Roma, Bollettino, Ser. 8,* 7(1/2):72–74, Jan./Feb. **1954.** 3 figs., 2 refs. **DWB**—Explanation of the graphical method of wind data presentation found in Hann-Süring **Lehrbuch der Meteorologie,** vol. 1, 1939. The merit of this presentation is that in addition to the directional frequency distribution it also shows the velocity distribution for each direction. *Subject Headings:* **1. Graphical presentation 2. Wind data.**—*G.T.*

7.8–54 551.501.7:551.547:551.510.3

Doporto, Mariano, **The computation of atmospheric pressure at the 8 Km level of constant air density.** *Eire. Meteorological Service, Geophysical Publications,* 3(4), **1951.** 17 p. 9 tables, 4 figs., 6 refs. **DWB**—A discussion of air density changes in an atmosphere with lapse rate independent of the height, based on the statistical equation, is given. An isopycnic layer, already known to exist at about 8 km, is identified with the level at which the standard deviation of the departures of air density from their average is a minimum. Underneath the isopycnic layer there is an isopycnic zone extending downwards for one or two km. A method for computing pressures at any level in the isopycnic zone is given. The method is worked out for a selected level, namely 8 dynamical kilometers and the pressures computed are checked against observations made on land and at sea with sounding balloons carrying meteorographs and radiosondes. In most of the cases the computed pressures differ from observed pressures by less than the probable instrumental errors. It is possible to improve the accuracy of the

method by a study of the analysed surface chart. It is suggested that a second isopycnic layer, quasi-horizontal, must exist at about 25 km. In the paper, values of air density computed from observations at several levels and in different latitudes, are given. *Subject Headings:* **1. Pressure computation 2. Upper air pressure 3. Isopycnic level 4. Air density measurement.**—*Author's abstract.*

7.8–55 551.501.7:551.557(52)

The relay observation of upper wind over Honjo and Tateno in the winter season 1951/1952. *Tateno, Japan. Aerological Observatory, Journal,* 5(3):199–218, March **1954.** 13 figs., 5 tables. In Japanese; English summary p. 199. **MH-BH**—The strong westerlies in the winter season over Japan make it difficult to carry out wind observations in the stratosphere. To overcome this difficulty balloon-sondes were released from a branch station at Honjo, situated 87.58 km in the azimuth of 283.51′ from the Aerological Observatory at Tateno. Observation by theodolite was made at both stations simultaneously with radio direction finders. Results are presented in tables and graphs. *Subject Headings:* **1. Upper air wind measurement 2. Japan.**—*From authors' abstract.*

7.8–56 551.501.8:551.557 551.501.8:551.594.1/2

Dieckmann, Max, **Funktechnische und atmosphärisch-elektrische Probleme der Stratosphärenforschung.** [Radio engineering and atmospheric-electric problems of stratospheric research.] *Deutsche Akademie der Luftforschung, Munich, Schriften,* No. 46:117–146, Sitzungsperiode 1939/1940, pub. **1941.** 17 figs., table, 12 refs. Discussion p. 145–146. **DLC**—The atmosphere is considered as consisting of two layers, from sea-level to the lower surface of the ionosphere, and the ionosphere. The wind direction and velocity are obtained from a small transmitter with antenna, carried by a sounding balloon. Heights are determined from the speed of ascent or barometric data. The radio waves emitted by the transmitter are received by two DF-receivers on the ground which measure the angles between the radio waves and N. From the position and height of the transmitter at successive times the wind is computed. The most suitable wave length is 10–11 m. The propagation characteristics are discussed theoretically and a formula for the computation of propagation distance, which could be reached under conditions that the transmitter and receiver are placed in an open space, is given: $r = \frac{9.55.10^{-3}}{S}\sqrt{N}$ where N = emission intensity, r = distance reached, S = required receiving field intensity in $\frac{\text{Volt}}{\text{m}}$. Direction finding and DF-receivers net is further discussed. The second part takes up the atmospheric-electric problems. Vertical distribution of the electric potential gradients and of transmission current values is shown on graphs, taken from Everling and Wigand, up to 9 km. *Subject Headings:* **1. Radio wind measurement 2. Atmospheric electricity measurement by radio.**—*C.E.P.B., N. A. Zikeev.*

7.8–57 551.501.81:77

Langleben, M. P. and Hitschfeld, Walter, **Photography at the AN/CPS-9 Weather Radar at Montreal Airport.** McGill Univ., Montreal, Stormy Weather Research Group, Contract AF 19(122)-217 and Canadian Defence Research Board Project D 48-95-11-08, Technical Note MWT-1, Jan. **1955.** 10 p. 7 figs. **DWB**—This note reports the installation of the CPS-9 Weather Radar at Montreal Airport and surveys briefly the methods adopted for photographing the scopes. It was found advantageous to photograph remoted displays thus giving the radar operator complete freedom to manipulate the controls at the main console. All permanent records are made on 16 mm movie film; but for purposes of immediate analysis and for facsimile transmission to another office, the scopes on the console are photographed from time to time with a Polaroid Land camera. In view of difficulties encountered with the RHI display a new scheme of three-dimensional scanning by means of the PPI display only is proposed. The work described in this note has been a joint undertaking of all members of the Stormy Weather Research Group. *Subject Headings:* **1. Radar scope photography 2. AN/CPS-9 radar 3. Radar photographs 4. Montreal, Canada.**—*Authors' abstract.*

OBSERVATIONAL DATA

See also: **Juneau Ice Field Res. Proj.** (Miller), 7.8–1; **Vertical temp., humidity and wind gradients** (Frankenberger), 7.8–8; **U.S.A.F. Solar Eclipse Proj.** (Shorey), 7.8–14; **Trans-Antarctic Exped., 1955–1958** (Stewart), 7.8–16; **C. Orlebar's weather book, 1786–1808** (Manley), 7.8–27.

7.8–58 551.506.2:551.521.11(410)

Booth, R. E., **The sunny weather of July 1955.** *Meteorological Magazine*, London, 84(1002):381–382, Dec. **1955.** **DWB**—In many parts of the British Isles July 1955 was the sunniest July on record. At Southport (329 hrs) and Blackpool (336 hrs) it was the sunniest month on record. *Subject Headings:* **1. Sunshine duration data 2. British Isles.**—*C.E.P.B.*

7.8–59 551.506.3(794)

*D'Ooge, Charles L. (*Michelson Lab., U. S. Naval Ordnance Test Station, China Lake, Calif.*), **Five years of weather observations on the White Mountain Range, California.** *American Meteorological Society, Bulletin*, 36(4):172–175, April **1955.** 5 figs., 5 refs. **DWB**—Meteorological observations made over a period of 5 years at 10 points in the White Mountain Range, Calif., 10,000 and 12,500 ft above sea level are summarized. Graphs showing for each year the mean monthly pressure, precipitation and temperature, maximum and minimum temperatures for each month, snowfall and water content, etc. in each month are presented. *Subject Headings:* **1. Meteorological data 2. White Mountain Range, Calif.**—*I.L.D.*

7.8–60 551.506.7(54)

*India. Meteorological Department, **Upper air data, Pt. A, Monthly means of pilot balloon data.** v. 17, v. 18, and v. 19, for 1944, 1945, and 1946, pub. **1954.** about 165 p. each. almost entirely tables. Price: Rs 10. **DWB**—Monthly mean pilot balloon (direction and speed) data for 57 stations in India (and Pakistan) arranged in 3 sections: 1) upper winds to 9 km; 2) upper winds above 9 km; and 3) late night ascents are tabulated *in extenso* in back of volume. (For abstract on earlier issues, *see* 5.10–40, Oct. 1954, *MAB*.) *Subject Headings:* **1. Upper air data 2. Balloon soundings 3. India.**—*M.R.*

7.8–61 551.506.8:633.16

*Kramer, C., **De warmtesom in de kiemingsperiode van zomergerst.** [Degree-days in the developmental period of summer barley.] *Netherlands. Meteorologisch Instituut, Wetenschappelijk Rapport, W.R.* 54-001 (III-132), **1954.** 25 p. 2 figs., 5 tables, 14 refs., eqs. English summary p. 25. **DWB**—The theory of constant heat sums (mostly given in the form of constant degree-day-sums) is criticized. Obviously there is no physiological basis for the view that a constant heat sum should be needed for the attainment of certain phenological stage. A number of publications dealing with this subject suffer from a lack of mathematical and statistical criticism. Under favorable circumstances, however, the method may be used as a practical rule, especially if the number of external factors affecting the development in a certain stage is small. As an example we treat the case of the degree-day-sum of soil temperature in the period between sowing and bearding of barley. Here we found in several cases (as well in Holland as in Denmark) with different varieties a fairly constant degree-day-sum of about 100. *Subject Headings:* **1. Degree days 2. Phenology 3. Barley.**—*Author's abstract.*

7.8–62 551.506.8:551.509.5

Seyfert, F., **Eintritt phänologischer Phasen und auslösende Wetterlagen.** [Occurrence of phenological phases and causative weather situations.] *Angewandte Meteorologie*, Berlin, 2(6):183–190, Dec. **1955.** fig., 11 refs. **DLC**—The outstanding phenological events of 1954 and 1955 in various parts of Germany followed a few days after effective weather situations—not single elements but complexes. Various phenological stages of a series of plants are discussed and it is shown that meteorological stimulation is not effective unless the plants are ready for it. The results are of interest for phenological forecasting. *Subject Headings:* **1. Phenology 2. Crop forecasting.**—*C.E.P.B.*

7.8–63 551.506.2(410):63

Lamb, H. H., **Weather of 1954.** *Scottish Geographical Magazine*, Edinburgh, 71(1):14–22, April **1955.** 5 figs. (incl. photos), 2 tables, ref. Also: Wannop, A. R., **The weather of 1954 and the Scottish farmer.** *Ibid.*, p. 23–26. **DWB**—Highlights of 1954 weather in the British Isles (and over entire N. Hemisphere) are brought out in this article. The cold Feb. and March, cool and damp summer and very wet autumn in Scotland and in most of England and Wales are emphasized. Summer thermal pattern is illustrated by 1000–500 mb thickness chart for July 1954, which shows cold (low) center over N. Polar area, covering most of Alaska and Alaska Gulf, Labrador-Newfoundland, British Isles and Central Siberia. Warm areas were S. Rockies, S. European Russia and Maritime Provinces of Siberia. Long period temperature, precipitation and "snow lying" variations show tendency to return to cool and snowy winters since 1926–40, and to cool summers since 1950, though it is too early to predict persistent trends. Wannop describes the difficulties of Scottish farmers. *Subject Headings:* **1. Weather anomalies 2. British Isles.**—*M.R.*

7.8–64 551.506.8(41/2)(09)

Uhlig, Siegfried, **Die Entwicklung der Phänologie in Grossbritannien.** [The development of phenology in Great Britain.] *Naturwissenschaftliche Rundschau*, 8(8):314–317, Aug. **1955.** 10 refs. **DWB**—British phenology began with Gilbert White's **Natural History of Selborne.** Observations near Norwich extend from 1746 to date with two breaks. Systematic phenology was begun by Preston in 1858. The Royal Meteorological Society published observations from 1870–1946, since when they have been collected at the Natural History Museum in London. *Subject Headings:* **1. Phenology 2. History of phenology 3. Great Britain.**—*C.E.P.B.*

INSTRUMENT CARRIERS

See also: **Thermometers for high-speed aircraft** (Clark), 7.8–67; **Airborne observ. of condensation nuclei** (Day), 7.8–80; **Speed correction coeff. of aircraft thermometers** (Durbin), 7.8–104; **Temp. measurem. at 30–80 km by rocket** (Ference), 7.8–165; **Wind measurem. at 30–80 km elev.** (Weisner), 7.8–185; **Upper atmos. wind and sonic velocity** (groves), 7.8–280.

7.8–65 551.507.36

Solar power for "Mouse." *Science News Letter*, Wash., D. C., 67(19):294, May 7, **1955. DLC**—Silicon solar batteries on a satellite circling from pole to pole would provide continuous power. "Mouse" could measure albedo of earth and clouds. Satellite need weigh only a few pounds and be not more than 1 ft in diameter. Ultraviolet radiation from sun, cosmic rays, corpuscles from sun, radio wave properties of ionosphere and density of upper atmosphere are other things that could be studied from data obtained by satellite, according to Dr. S. F. Singer of Univ. of Maryland at American Rocket Society Meeting in Baltimore. *Subject Headings:* **1. "Mouse" observations 2. Satellite observatories. I. Singer, S. F.**—*M.R.*

7.8–66 551.507.362

Cross, C. A., **Extra-terrestrial observatories—their purpose and location.** *British Interplanetary Society, London, Journal*, 14(3):137–143, May/June **1955.** fig., 2 tables, 11 refs., 3 eqs. **DLC**—The progress of astronomy is greatly impeded by the earth's atmosphere, its gravitation, and its rotation in space. Irregularities in the air prevent telescopic resolution of the fine detail, light absorption in the air prevents measurements except in the narrow visible region, and luminosity of the upper air prevents long exposures by fogging photographic plates. The gravitational field causes deflections in the mechanical and optical structure of the telescope. A telescope out in space suffers none of these disadvantages. It is shown that an 800-in. telescope in space would be capable of detecting solar systems like our own at distances of up to 20 light years. Their detection would indicate the likelihood of there being other intelligent life in the universe. The construction of large parabolic mirrors in space is discussed, and it is suggested that they may be made from thin aluminized diaphragms of thermoplastic material. *Subject Headings:* **1. Satellite observatories 2. Astronomy.**—*Author's abstract.*

INSTRUMENTS

See also: **Mercury barometers** (Teddington, Nat'l Phys. Lab.), 7.8–52.

7.8–67 551.508.26:551.507.352

Clark, D. D., **Development of thermometers for high-speed aircraft.** *Great Britain. Meteorological Research Committee, M.R.P.*, 960, Jan. 26, **1956.** 13 p. 7 figs., 5 tables, 16 refs., eqs. Mimeo. **DWB**—The principle aimed at was to make the 'recovery factor' λ constant. Three designs of flat plate thermometer were tested in a wind tunnel, and one having a conical shape was selected as the most practicable. In this λ was sensibly constant at .881; the temperature error was <0.1°C from Mach 0.2 to 0.8, and only 0.23°C at 0.9. Protection from radiation was provided by making the outer cover as highly reflecting as possible. The thermometer is mounted on a 'sting' protruding from a leading edge. *Subject Heading:* **1. Airplane thermometers.**—*C.E.P.B.*

7.8–68 551.508.25:551.501.4

Ridel', E. A. and Shubtsova, V. G., **O vychislenii radiatsionnogo balansa po izmereniiam termoelektricheskim balansomerom Ianishevskogo.** [Calculation of the radiation balance from measurements of the thermoelectric balance meter of Ianishevskiĭ.] *Meteorologiia i Gidrologiia*, Moscow, No. 3:49–50, May/June **1955.** ref., 6 eqs. **DWB**—The receiving surfaces of the Ianishevskiĭ thermoelectric balance meter may differ in sensitivity. Equations are developed for calculating radiation balance in cases of repeated measurement. *Subject Heading:* **1. Radiation balance calculations.**—*I.L.D.*

7.8–69 551.508.29

Sion, Elio (*Airborne Instruments Lab., Inc., Mineola, N. Y.*), **Time constants of radiosonde thermistors.** *American Meteorological Society, Bulletin*, 36(1):16–21, Jan. **1955.** 6 figs., 2 tables, eqs. **DWB**—The time constant for thermistors for conditions occurring at discrete atmospheric pressures is investigated. The experimental set-up including the test changer, the calibration equipment and the testing procedure are described. Thermistor constants were determined at various air speeds from 500 to 2750 ft/min. The results showing the relation of time constant to air velocity with pressure temperature combinations in the "average" atmosphere as parameters are presented graphically. *Subject Headings:* **1. Thermistors 2. Thermistor constants.**—*I.L.D.*

7.8–70 551.508.53/4

Kawano, Yukio and Watanabe, Tsutomu, **Tests of Friez Aero-Vane on board a ship.** *Journal of Meteorological Research*, Tokyo, 6(7):264–270, Sept. **1954.** 7 figs., 5 tables, 2 refs. In Japanese; English summary p. 264. **DWB**—Tests of the Friez Aero-Vane were done on board the C.M.O. weather ship "Shiga-Maru" at the north point (153°E, 39°N) from 7th to 21st April 1953. The following results were obtained. 1) Prevailing frequency of about 8 sec., which is equal to the rolling frequency of the ship, was found in the wind recording. 2) Gustiness factor $[=(V_{max}-V_{min})/(V_{max}+V_{min})$, where V_{max} and V_{min} are respectively the maximum and the minimum of wind velocity for continuous 10-minutes] is almost independent of the mean wind velocity and increases with the wave height as shown in Figs. 6 and 7. 3) Mean wind velocity for 30 sec. or more is very close to the mean wind velocity for 10 minutes on the sea; and the space of 30 sec. is good enough to get the mean wind velocity from ship observations. *Subject Headings:* **1. Friez aerovanes 2. Wind measurements.**—*Authors' abstract.*

7.8–71 551.508.54(26)

Sanuki, M. and Kimura, S. (*Met. Res. Inst., Tokyo*), **The change of rotational speed of cup anemometer for marine use due to rolling and suspected cause of its damage.** *Papers in Meteorology and Geophysics*, 4(2):93–94, Sept. **1953.** fig., ref. **MH-BH**—Wind tunnel tests of cup anemometers which were tilted in imitation of a ship's rolling motion, showed considerable rotational speed variations of the instruments. It is suggested that ordinary anemometer arms are not strong enough to carry a load corresponding to such speed variations.

It is recommended that arms of anemometers be reinforced if the instruments are used o board ships. *Subject Headings:* **1. Cup anemometers 2. Marine instruments.**—*G.T.*

7.8–72 551.508.5

Dalziel, K. (*Antarctic Div., Dept. of External Affairs, Melbourne, Australia*), **Rawi measurements at Heard Island.** *Australian Meteorological Magazine*, Melbourne, No. 10 47–56, Sept. **1955.** 3 figs., 2+tables, ref. **DWB**—A brief description is given of a radio theodolite installed at Heard Island for use in upper wind observations. The accuracy an reliability of the equipment are discussed and it is concluded that its installation has permitte a considerable advancement in upper wind studies at Heard Island. *Subject Heading* **1. Rawinsondes 2. Radiosonde theodolites 3. Heard Island.**—*Author's abstract.*

7.8–73 551.508.71:551.501.

Compressed air hygrometer for measuring frost point in the stratosphere. *Natur* London, 177(4508):568, March 24, **1956. DWB**—In the Dobson-Brewer frost point hy grometer the ice deposit becomes glassy and difficult to see at −85°C. A. W. Brewer sug gested using compressed air to extend the range of the instrument and P. Goldsmith propose the use of the engine compressor of a jet aircraft for the purpose. Results of 35 ascents t 50,000 ft with this apparatus are summarized. *Subject Heading:* **1. Dobson-Brewer frost poin hygrometer.**—*C.E.P.B.*

7.8–74 551.508.72:551.573

*Germany. Deutscher Wetterdienst, **Bericht über Messungen mit dem Piche-Evap orimeter in einem Sondernetz von 20 Stationen.** [Report on measurements with the Pich evaporimeter in a network of 20 stations.] Bad Kissingen, Jan. **1955.** 38 p. tables. **DWB** —Evaporation data for 20 stations in West Germany are tabulated by station for each month from July–Oct. 1954, and for all stations comparatively by 5-day periods. The Piché evaporimeter is considered practicable for daily use in spite of faults which are fully discussed Effect of rain, hail, temperature, sunshine, etc. are considered and best means of obtaining accurate results, recommended. *Subject Headings:* **1. Evaporation networks 2. Evaporation data 3. Pichè evaporimeter 4. West Germany.**—*M.R.*

7.8–75 551.508.74

Shaw, R. H., **Comparison of two types of dew duration recorders.** Iowa. State College. Dept. of Agronomy, Contract AF 19(604)-589, Scientific Report, No. 2, Feb. 15, **1955.** 13 figs. (incl. photos), table, 3 refs. **DWB**—This report describes the results obtained in testing two types of dew duration recorders. The Taylor recorder uses an indelible pencil marking on a ground glass plate as its sensitive element. The Wallin-Polhemus recorder uses a strip of animal membrane as its sensitive element. The operation of both recorders is discussed. The results obtained with the two recorders when tested in grass and soybeans are presented. The two recorders gave very similar results, with quite high correlations obtained between duration on the recorders and the crop cover. The advantages and disadvantages of each recorder are discussed. *Subject Heading:* **1. Dew duration recorders.**—*Author's abstract.*

7.8–76 551.508.765

aufm Kampe, H. J.; Weickmann, H. K. and Kelly, J. J., **A continuously recording water-content meter.** *Journal of Meteorology*, 13(1):64–66, Feb. **1956.** 4 figs., 5 refs. **DWB**—A simple airborne probe for continuous measurement of water content of clouds is described. Two platinum wires forming the electrodes of a 24 v battery are wound round an insulated cylinder and the space between them filled with lithium chloride. When the salt is wetted (by impingement of cloud particles) resistance decreases and a current flows which causes the water to evaporate. Half-recovery time is ½ sec. Calibration is described (there is no temperature influence) and a specimen record shown. *Subject Heading:* **1. Water content of cloud meter.**—*C.E.P.B.*

7.8–77 551.508.77

†Yajima, Y., **On the rain gauge wind shield.** *Journal of Meteorological Research*, Tokyo, 5(8):693–699, Sept. **1953.** 4 figs., table, 20 refs. In Japanese; English summary p. 693.

DWB—Observed rainfall amount is ffected by wind, that is called the Jevons effect, and the value is not accurate. The author illustrated the Jevons effect on rain gages with and without wind shield. It follows that the former shows more accurate amount than the latter. There exist the following relationships, $pm = Ms/M = 1.1$ in case of rainfall, $pm = 1.5$–1.8 in case of snowfall, where M_s and M are the rainfall amount observed by the rain gage with and without wind shield respectively. *Subject Heading:* **1. Rain gage shields.**—*Author's abstract.*

7.8–78 551.508.822:551.524:551.508.4

Graafen, H. and Pauly, E., **Die temperaturbedingte Luftdruckkorrektion der Radiosonde H 50 auf Grund von Druckkälteeichungen.** [Atmospheric pressure correction of radiosonde H 50 due to temperature on the basis of cold pressure calibration.] *Germany. Deutscher Wetterdienst. Instrumentenamt Nord, Hamburg, Technische Mitteilungen, New Ser.*, No. 1:44–49, **1955.** fig., table, 6 refs., 6 eqs. **DWB**—The method and results of an investigation carried out for the purpose of determining the necessity of calibration of pressure elements for temperature effect for each individual radiosonde are described and presented. It is shown that for the determination of temperature induced air pressure corrections of the radiosonde H 50, cold (temperature) pressure calibration is not much superior to calculation methods. In estimating the value of each of these methods of correction one should consider, in the first place, the time, personal and financial investments for cold pressure calibration against the advantages. In case that the use of calculating methods would be continued the author advises that the values of the constants β and ϵ should be checked from time to time by measurements in the cold pressure chamber. *Subject Headings:* **1. Temperature effects on pressure 2. Radiosonde calibration.**—*A.M.P.*

7.8–79 551.508.822:551.524.7

Scrase, F. J., **Application of radiation and lag corrections to temperatures measured with the Meteorological Office radio-sonde.** *Meteorological Magazine*, London, 85(1005):65–75, March **1956.** 2 figs., 5 tables, 4 refs., 7 eqs. *Also:* Hawson, C. L., **Meteorological Office practice for the application of radiation and lag corrections to temperatures measured by radio-sonde Mk IIB.** *Ibid.*, p. 75–78. 6 refs. **DWB**—Scrase discusses the factors affecting the errors—albedo at M.O. stations as "seen" from 20 km, rate of ascent, and swinging of radiosonde at low solar altitudes. Radiation errors are reevaluated and radiation and lag corrections given in diagrams and tables. A method of evaluating lag errors at discontinuities is set out. Hawson outlines the methods of applying the corrections on a routine basis at M.O. stations. *Subject Headings:* **1. British radiosondes 2. Upper air temperatures.**—*C.E.P.B.*

7.8–80 551.508.91:551.507.352 551.574.1

Day, G. J. (*Royal Aircraft Estab., Farnborough, Eng.*), **Some airborne observations of condensation nucleus concentration.** *Geofisica Pura e Applicata*, Milan, 31:169–181, May/Aug. **1955.** 7 figs. (incl. graphs and photo), 2 tables, 6 refs. Discussion, p. 180–181. **DWB, DLC**—The measurement of condensation nucleus concentration from an aircraft is considered, and preliminary observations made with a photo-electric condensation nucleus counter are discussed. It is concluded that at heights up to 6000 ft concentrations of condensation nuclei vary from 200 cm^{-3} in clean maritime air to 5×10^3 cm^{-3} generally over large industrial areas and 35×10^3 cm^{-3} downwind of specific industrial sources. It appears that sea spray makes a contribution to the nucleus population. *Subject Headings:* **1. Airplane nuclei counters 2. Nuclei free air.**—*Author's abstract.*

7.8–81 551.508.91:621.317.7

Rich, T. A. (*Gen'l. Electric, Schenectady, N. Y.*), **A photo-electric nucleus counter with size discrimination.** *Geofisica Pura e Applicata*, Milan, 31:60–65, May/Aug. **1955.** 5 figs., 2 refs., 3 eqs. German and English summaries, p. 60. **DWB, DLC**—A variation of the Nolan-Pollak photo-electric nucleus counter for size discrimination is described. Instead of applying an over-pressure, the sample in fog-tube of the new instrument starts at atmospheric pressure and expands into two evacuated containers. The expansion into the first container is as rapid as possible and this determines the maximum supersaturation. The expansion into the second is slow enough to permit the growth of water drops to limit the supersaturation

below the initial value, and yet fast enough so that the expansion is essentially adiabatic. The calibration is essentially the same as long as the sum of the two volumes is constant, and only those particles smaller than the size determined by the initial supersaturation contribute to the reading. *Subject Headings:* **1. Nuclei counters 2. Photoelectric meters.**—*Author's abstract.*

7.8–82 551.508.92 551.508.762

Bibby, J. R., **Fog density indicator.** *Great Britain. Meteorological Research Committee, M.R.P.*, 943, Sept. 28, 1955. 2 p. fig. Mimeo. **DWB**—An instrument is described consisting of 2 layers of photocells sealed between two sheets of perspex. Light from 3 lamps is scattered into the photocells by fog, generating a current which is proportional to the scattering coefficient of the air. It is mounted on a wire from a radiosonde balloon and gives the height of base or top of a fog or cloud layer and some indication of density. It can only be used in darkness at least 50 ft above the ground. *Subject Headings:* **1. Fog density indicators 2. Cloud meters.**—*C.E.P.B.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Weather analysis** (Petterssen), 7.8–4; **Phenological phases and weather** (Seyfert), 7.8–62.

7.8–83 551.509.1:551.509.312

Smebye, S., **Einige Tendenzberechnungen mit einem sogenannten $2\frac{1}{2}$ dimensionalen Modell.** [Some tendency calculation with a so-called $2\frac{1}{2}$ dimensional model.] *Berlin. Freie Universität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(3):199–208, 1954. 6 figs., 2 refs., eq. **DWB**—The author describes a model of the temperature field in which vertical temperature distribution is expressed by the relative topography. The height of the 500 mb surface and relative topography 500/1000 mb are independent variables and the 500 mb and 1000 mb tendencies are calculated by means of the forecasting equations $\Delta Z + C\Delta h_t + DJ_1 + EJ_2 + G(H_t + J_3)Dh = 0$ and $\Delta h_t + Hh_t + HJ_3 + KJ_1 + KJ_2 = 0$ when D, E, G, H and K are constants depending upon $A(p)$, which determines the vertical wind and temperature distribution, t—differentiation for time, J_3—transport, y—the relative topography h, J_1 and J_2—vorticity transport in ten isobaric surfaces dependent upon $A(p)$. The application of the model is illustrated. *Subject Headings:* **1. Barometric tendency calculation 2. Relative topography 3. Vertical temperature distribution.**—*I.L.D.*

7.8–84 551.509.25

Lingelbach, E., **Wege zur Verbesserung der Vorhersagekarte.** [Ways to improve the forecast map.] *Berlin. Freie Universität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(3):62–82, 1954. 19 figs. (incl. maps), 4 tables. **DWB**—No improvement has occurred in the prognostic charts during the past six years in Germany and England. Improvement can be achieved by a systematic study of missed forecasts by means of objective procedures. This involves the use of principal rules such as Scherhag's rule that the displacement of the 24 hr pressure change region at velocity half that of the flow at 500 mb, and a new steering chart prepared by Fjørtoft. *Subject Headings:* **1. Prognostic charts 2. Forecast improvement.**—*I.L.D.*

7.8–85 551.509.25:551.509.5

Teweles, Sidney, Jr. and Wobus, Hermann B. (*U. S. Weather Bur., Wash., D. C.*), **Verification of prognostic charts.** *American Meteorological Society, Bulletin*, 35(10):455–463, Dec. 1954. 5 figs., 4 tables, ref., 3 eqs. **DWB**—The meteorological features of the 30-hour prognostic chart prepared by the Weather Bureau Air Force Navy Analysis Center (WBANAC) is described and the desirable characteristics of a system for scoring prognostic charts are set forth. The verification system used in the WBANAC is described. "The preliminary score is a function of the pressure difference between pairs of points selected within the main portion of the forecast area." "A secondary score, the deviation from a mean of daily scores adjusted by handicaps assigned to the individual forecasters, is a measure of forecasting skill independ-

ent of many spurious effects." A completed verification is presented. *Subject Headings:* **1. Prognostic charts 2. Forcast verification.**—*I.L.D.*

7.8–86 551.509.31:551.515.8

Three-front model. *Meteorological Magazine*, London, 85(1005):83–88, March **1956.** 2 refs. **DWB**—B. W. Boville of the Canadian Central Analysis Office, opening the discussion, described the procedure in Canada. Frontal-contour analysis showed 3 main zones, Polar, Maritime and Arctic fronts. The major feature was a trough of warm air aloft, termed "trowal," which some British speakers compared to an occlusion. The jet stream was mapped by isotach analysis at 300 mb. A number of speakers took part in the discussion. *Subject Headings:* **1. Frontal analysis 2. Canada. I. Boville, B. W.**—*C.E.P.B.*

7.8–87 551.509.311(521.41):551.515.12

Sōtsuka, S., **On the cold-air outbreak in early February, 1953.** *Journal of Meteorological Research*, Tokyo, 7(2):84–91, March **1955.** 6 figs., 2 tables, 3 refs. In Japanese; English summary p. 84. **DWB**—The synoptic situation for the period Jan. 31 through Feb. 4, 1953 was analyzed as an example of the cold-air outbreak in the Jōetsu District, on the coast of the Sea of Japan. The remarkable phenomena associated with the cold-air outbreak are as follows: 1) An elongated polar tongue of cold air is cut off by a retarding high-latitude anticyclone at 700 mb and 500 mb level. 2) A cold low is generated on the south side of the cold air in this period. 3) The recurvature point of the retarding anticyclone is at 90°E long. 4) The southward advection of upper cold air was accompanied by a stationary ridge in the vicinity of 80°E long., and a resulting long wave over the eastern part of the Pacific. *Subject Headings:* **1. Cold air outbreaks 2. Cold lows 3. Synoptic aerological studies 4. Jōetsu District, Japan.**—*Author's abstract.*

7.8–88 551.509.312

Berkofsky, Louis, **A three-parameter baroclinic numerical-prediction model.** *Journal of Meteorology*, 13(1):102–111, Feb. **1956.** table, 3 refs., 71 eqs. **DWB**—From the premise that the modelling approximation for an integrated numerical-prediction model is given by a constraint on the stability factor in the first law of thermodynamics for adiabatic flow, a three-parameter baroclinic model is devised. The resulting flow equations contain development terms which reflect interaction between surface and 500-millibar effects. It is shown that the three-parameter model is a natural outgrowth of an attempt to render two-parameter models internally consistent. *Subject Heading:* **1. Numerical forecasting.**—*Author's abstract.*

7.8–89 551.509.312:551.511:551.513.1

Blackburn, Jacob F. and Gates, W. Lawrence, **Note on hemispheric numerical integration of the barotropic model.** *Journal of Meteorology*, 13(1):59–63, Feb. **1956.** 2 figs., 8 refs., 2 eqs. **DWB**—Numerical integration over a hemisphere was tried, to minimize the effect of boundary conditions. The procedure is described, and illustrated by barotropically computed changes of the 500 mb flow 24 hours ahead. Agreement with observed changes is good. The errors are described; those due to poor upper air data form a significant part. *Subject Headings:* **1. Numerical forecasting 2. Barotropic models.**—*C.E.P.B.*

7.8–90 551.509.312:551.513.1

†Brandejs, Stanislav, **Dynamické předpovední methody v synoptické meteorologii; I. Sutcliffeova methoda vývoje.** [Dynamic forecasting methods in synoptic meteorology, Pt. 1, Sutcliffe's development method.] *Meteorologické Zprávy*, Prague, 5(4):94–100, **1952.** 2 figs., 2 tables, 17 refs., 26 eqs. English summary p. 94. **DLC.** Also his: **Dynamic forecasting methods.** [Translation from original Czech in *Meteorologické Zprávy*, Prague, 6(3):69–71, June **1953.** 3 figs., 9 refs., 16 eqs. Photostat No. 395. 8 p.] **DWB**—The first article contains basic theory of Sutcliffe's method: (1) equation of relative divergence assuming adiabatic processes and indifferent equilibrium, (2) computation of $v \cdot \Delta_2 \xi$ according to Sawyer and Matthewman, (3) numerical prediction of the absolute topography of 1000 mb and (4) effect of vertical stability on synoptic development. The second article is a review of the

methods of numerical forecasting of barotropic surfaces following SUTCLIFFE, CHARNEY, HINKELMANN and SAWYER as well as previous work of the author. Application to high-speed computing machine solution of equations; grids and networks used, etc. are mentioned. *Subject Headings:* **1. Numerical forecasting techniques 2. Barotropic tendency equation.**—*Author's abstract and M.R.*

7.8–91 551.509.312:551.511:551.553.8

Gregor, Zdeněk, **Rozbor povětrnostní situace provázené orkánem na území ČSR, ze dne 17. ledna 1955.** [Analysis of the meteorological situation accompanied by a gale over Czechoslovakia on Jan. 17, 1955.] *Meteorologické Zprávy*, Prague 8(3):80–82, June **1955.** 6 figs., 4 refs. Russian summary p. 80. **DWB**—A low-pressure area which advanced from the Bermudas to the northeast over the Atlantic Ocean regenerated over the British Isles on an Arctic front and moved over the European continent. The development of dynamic pressure changes is analyzed according to the advective dynamic method and SUTCLIFFE's method and results obtained with the two methods are compared. *Subject Headings:* **1. Dynamic pressure changes 2. Advective dynamic analysis 3. Gales 4. Czechoslovakia.**—*Trans. of author's abstract.*

7.8–92 551.509.312:517.9

Rowe, Paul P. (*Gen. Electric Co., Richland, Wash.*), **Difference approximations to partial derivatives for uneven spacings in the network.** *American Geophysical Union, Transactions*, 36(6):995–1008, Dec. **1955.** 3 figs., ref., 78 eqs. **DWB, DLC**—Difference expressions are developed which do not require even spacings in the network. These difference expressions are obtained by three different methods. The methods are Taylor's series expansion, operator calculus, and stencil mathematics. These difference expressions can then be applied in either the relaxation or iteration process. The errors involved in replacing the derivatives with these difference expressions are investigated. Most of these difference expressions are developed for use with the Laplace equation or the related equation, $h_{xx}+jh_{yy}=0$. *Subject Heading:* **1. Differential analysis.**—*Author's abstract.*

7.8–93 551.509.312

Smedley, David, **Test of numerical five day contour forecast.** U. S. Weather Bureau, [1955?] 6 p. 3 refs., 7 eqs. Typescript. **DWB**—During 1954, 5-day forecasts were made on an experimental basis (for 18, 5-day periods) to test a numerical method suggested by J. NAMIAS. The method was based on the relation of the variability of monthly and 5-day height anomalies, and the similarity of 5-day mean maps to individual maps during the 5-day period. The numerical method was tested against two other methods and the official method used in the Weather Bureau Extended Forecast Unit found to be slightly better. *Subject Headings:* **1. Numerical 5-day contour forecasting 2. Numerical forecast evaluation 3. U. S. Weather Bureau. Extended Forecast Division.**—*M.R.*

7.8–94 551.509.312:551.543.1

§Teweles, Sidney, Jr. (*U.S.W.B., Wash., D. C.*), **Tentative normal diurnal height-change charts of the 500-millibar surface over the United States.** *American Meteorological Society, Bulletin*, 35(6):261–270, June **1954.** figs., 3 refs. **MH-BH**—Charts showing the smoothed mean monthly diurnal height change of the 500-mb surface during 1949–51 at U. S. Weather Bureau radiosonde stations are presented. The technique of preparation of these charts is described; the influence of errors in temperature measurement of the 500-mb diurnal height chart and the relation between diurnal pressure changes and the 500-mb chart are discussed. *Subject Headings:* **1. Pressure change charts 2. Diurnal pressure variations 3. United States.**—*Based on author's abstract.*

7.8–95 551.509.312:551.547.3:519.241.1

White, Robert M., **Pressure-height predictability as a function of the type and amount of initial data.** *Journal of Meteorology*, 13(1):40–45, Feb. **1956.** fig., 7 tables, 2 refs., 8 eqs. **DWB**—Multiple regression equations for prediction of 1000, 500 and 200 mb heights, using

various combinations of these at 8 stations in the U. S., were found by electronic computing. The inclusion of 1000 mb and 200 mb data gave a significant increase of predictability over 500 mb data alone. *Subject Headings:* **1. Numerical forecasting 2. Height tendency computation 3. Regression equations.**—*C.E.P.B.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

ATMOSPHERIC POLLUTION

See also: **Air Pollution Control Assoc. Proc., 7.8–3.**

7.8–96 551.510.42:628.53

Frew, Sir Sidney, **Smoke reduction and fuel efficiency by measurement and control.** *Smokeless Air*, 97:176–180, Spring **1956. DWB**—Economical use of fuel for power needs efficiency in steam generation, which can only be secured by use of instruments for recording CO_2, $CO+H_2$ and flue gas temperature, steam flow meter, measurement of fuel used, and smoke recording equipment. Advantages of automatic control are listed. *Subject Heading:* **1. Smoke abatement.**—*C.E.P.B.*

7.8–97 551.510.42(058)

The investigation of air pollution: The new report. *Smokeless Air*, 97:156–159, Spring **1956.** 2 figs. **DWB**—Review of Dept. of Scientific and Industrial Research, **The investigation of atmospheric pollution, 27th report.** Diagram shows trends of pollution of different types and of coal consumption, 1939–44 to 1949–54. Average smoke concentration has decreased but grit has increased. *Subject Headings:* **1. Atmospheric pollution reports 2. Great Britain.** —*C.E.P.B.*

7.8–98 551.510.42:697.8

Nonhebel, G., **The density of washed plumes from power stations.** *Smokeless Air*, 97:182–183, Spring **1956. DWB**—Criticizes R. S. Scorer's article: **An effect of gas washing at Battersea Power Station,** *Smokeless Air*, 95, Autumn 1955 (*see* 7.2–118, Feb. 1956, *MAB*). There is no evidence that liquid drops escape in appreciable quantity, or that plumes of washed gas have a tendency to fall. *Subject Heading:* **1. Smoke plumes.**—*C.E.P.B.*

7.8–99 551.510.42:551.575.1(42)

The recent smogs. *Smokeless Air*, 97:192–193, Spring **1956.** fig. **DWB**—Account of smogs in N.W. England on Nov. 17–18, 1955, and all England on Jan. 4–7, 1956. *Subject Headings:* **1. Smog 2. England.**—*C.E.P.B.*

7.8–100 551.510.42:69:620.19:551.524.37

Schaffer, R. J., **Stone in architecture, Pt. 2, The weathering, preservation and restoration of stone buildings.** *Royal Society of Arts, Journal*, 103(4963):843–867, Oct. 28, **1955.** 18 figs., table. **GB-MO**—Stone normally weathers slowly. Smoke blackens the surface and SO_2 dissolves in rain and attacks limestones and sandstones which contain carbonates, forming soluble salts. Frost damages saturated stone but plain walls are seldom affected. Chlorides affect buildings near the sea. Microorganisms also play a part. Various preservatives are discussed, but experience with them is discouraging. Cleaning is beneficial. Methods of testing are described. *Subject Headings:* **1. Weathering of stone 2. Atmospheric pollution effects 3. Frost damage to buildings.**—*C.E.P.B.*

7.8–101 551.510.42:551.575.1(421)

Waller, R. E. and Lawther, P. J., **Some observations on London fogs.** *British Medical Journal*, Dec. 3, 1955. **DSG.** Summarized as **Dry fog** in *Smokeless Air*, 97:172, Spring **1956. DWB**—Observations on Jan. 9, 1955, when visibility fell to 70 yards although no water was present. Smoke reached 6.5 mg/m³ and had a marked effect on bronchitics. *Subject Headings:* **1. Smog 2. London, England.**—*C.E.P.B.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Effect of soft X-rays on formation of E layer** (Elwert), 7.8–151; **Geomagnetic field and turbulence in ionosphere** (Dungey), 7.8–173; **Determination of horizontal velocity of ionospheric movements** (Chappell, Henderson), 7.8–181; **Determination of ionospheric winds** (Court, Gilfillan), 7.8–182; **F-region collisional frequency** (Ghosh), 7.8–263; **Electron distribution in ionosphere** (King), 7.8–264; **Electron content of F-region** (Sheriff), 7.8–265; **Beyond-the-horizon radio transmission** (Bullington), 7.8–276; **Fading of F-region coupling echo** (Parkinson), 7.8–279.

7.8–102 551.510.5:551.521.64:551.543

Trefall, H., **On the barometer effect on the hard component of the cosmic radiation.** *Physical Society of London, Proceedings, Sec. A*, 68(11):953 961, Nov. 1, **1955.** 2 figs., 2 tables, 17 refs., 13 eqs. **DWB**—If barometric pressure increases, the survival probability of μ-mesons decreases. By partial correlation of meson intensity at sea level with sea level pressure and height of the 100 mb level, it is shown that about 2/3 of this effect is due to absorption and 1/3 to a change in the mean life of a μ-meson. *Subject Heading:* **1. Cosmic ray mesons.**—*C.E.P.B.*

7.8–103 551.510.53:551.594.12:523.51

†Öpik, E. J., **Meteors of the upper atmosphere.** *Irish Astronomical Journal*, 3(6):165–181, June **1955. DLC.** Also issued as: *Armagh Observatory, Leaflet*, No. 30. 6 tables, 32 refs., 7 eqs. **DWB**—Discrepancies above 95 km between atmospheric densities calculated from meteor observations and rocket data are attributed to most meteors being fluffy aggregates which crumble into small fragments; only meteorites and the more brilliant meteors are solid masses. The consequences of this theory are discussed. New tables for the ionizing efficiency and penetration of meteor atoms are given and radar observations of metor velocity discussed. *Subject Headings:* **1. Meteor theories 2. Meteor ionization trails.**—*C.E.P.B.*

7.8–104 551.510.534 535.242

Valníček, Boris, **Přístroj pro měření celkového množství ozonu v zemské atmosféře astronomickou metodou.** [Instrument for astronomic measurement of the total amount of atmospheric ozone.] *Meteorologické Zprávy*, Prague, 8(3):83 84, June **1955.** 4 figs., 3 refs. Russian and German summaries p. 82. **DWB**—A photoelectric photometer operating in the region of Huggins' absorption bands of ozone in the solar spectrum is described. The instrument works around 3240 Å with the use of a selective filter. Details of measurement and analysis are discussed. Analysis is based on the Bouguer line derived from the measurements. The value obtained is total ozone content expressed in centimeters of homogeneous atmospheric layer thickness. *Subject Headings:* **1. Ozone measurement 2. Photoelectric photometer.**—*Trans. of author's abstract.*

7.8–105 551.510.535:621.396

Beynon, W. J. G. and Brown, G. M., **Region *E* and the *Sq* current system.** *Nature*, London, 177(4508):583 584, March 24, **1956.** 2 figs., 4 refs., 2 eqs. **DWB**—Critical frequency is related to solar zenith angle by $(fE)^n = K \cos \chi$, n varies from 2 4 and authors attribute this to the vector drift velocity. Curves of n at 12 h for 150°E (shown), 10°E and 70°W show peaks near 35°N and 30°S which are attributed to vertical drift. At 15 h values of n are smaller and show no peaks. Hourly values at Tokyo show a maximum at 11 h, when the E W component of the *Sq* current and hence the vertical drift are greatest. In the F1 region there is no sharply defined maximum. *Subject Headings:* **1. Radio critical frequency 2. E layer.**—*C.E.P.B.*

7.8–106 551.510.535:551.594.7

Bowhill, S. A., **The fading of radio waves of frequencies between 16 and 2400 kc/s.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(3):129-145, March **1956.** 14 figs., 2 tables, 13 refs., 11 eqs. DWB—The lowest ionosphere, which reflects low frequency radio waves, contains irregularities which cause fading of these frequencies. These have been studied by 3 types of experiment at Cambridge, Eng., using nearly vertical incidence at night. The range 16-200 kc/s shows shallow fading with a quasi-period of 7 min up to 70 kc/s, above

this a quasi-period of about 1 min appears as well, increasing until it dominates the slower fading. Two receivers tuned to 85 kc/s separated by various distances gave fading records indicating structure sizes at the ground of 5 km for the slow fading and 1 km for the fast fading. Thirdly, records at 3 receivers at right angles on 70 kc/s show that the slow fading is due mainly to random velocities of about 40 m/s, with a much smaller drift velocity varying irregularly from an average of 20 m/s to NNE at 0130 to 17 m/s to ENE at 1930. A suggested model of irregularities in the D region at night is shown. *Subject Headings:* **1. D layer 2. Radio fading.**—*C.E.P.B. and author's abstract.*

7.8–107 551.510.535:551.590.24

Bramley, E. N., **Tilts in the ionosphere during the solar eclipse of 30 June 1954.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):98–104, Feb. 1956. 6 figs., 4 refs. **DWB**—Directional measurements at nearly vertical incidence on the F layer during the eclipse showed the existence of a tilt whose direction agreed with that expected from the geometry of the eclipse. The magnitude of the tilt was also of the same order as that calculated from observed changes in the height of reflection. Oblique-incidence bearing measurements on signals reflected from the normal E layer failed to reveal any eclipse effect, and theoretical calculation showed that no detectably large effect would have been expected in this case. *Subject Headings:* **1. Ionospheric tilt 2. Eclipse effects 3. Solar eclipse, June 1954.**—*Author's abstract.*

7.8–108 551.510.535

Burkard, O., **Die tages- und jahreszeitlichen Variationen der F_1-Ionisation: ein Deutungsversuch.** [The daily and annual variations of F_1-ionisation and their interpretation.] *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):83–90, Feb. 1956. 2 figs., 3 tables, 8 refs., 10 eqs. English and German summaries p. 83. **DWB**—The relation $(f_0F_1)^2 = C^2 (\cos \chi)^x$ is verified and values of x and log C computed for Washington. The relation is explained by a linear increase of temperature with height in the F_1 layer. The temperature gradient is smaller and the warm layer thicker in summer than in winter. *Subject Headings:* **1. Ionospheric variations 2. F1 layer ionization.**—*C.E.P.B.*

7.8–109 551.510.535:533.16

Dungey, J. W. and Willson, A. J. *(both, Cavendish Lab., Cambridge, Eng.)*, **Viscosity in the F region.** *Journal of Geophysical Research*, Wash., D. C., 60(4):521–523, Dec. 1955. eqs., 5 refs. **DLC**—The problem of viscosity for disturbances whose scale is smaller than the mean free path is attacked by means of Boltzmann's equation. It is shown that the phenomenon cannot be described by an "effective coefficient of viscosity" and that viscosity is of primary importance under these conditions. The implications for the aerodynamics of the F region are discussed. *Subject Heading:* **1. F layer viscosity.**—*Authors' abstract.*

7.8–110 551.510.535

Ellis, G. R., **The Z propagation hole in the ionosphere.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):43–54, Feb. 1956. 7 figs., 2 tables, 8 refs., 4 eqs. **DWB**—The occurrence of F-region triple-splitting allows us to examine experimentally the properties of an unusual propagation hole in the ionosphere. Two methods of estimating the angular size of the hole are discussed. The first is based on the beam effect of Z echoes, according to which Z echoes are returned to the ground in a narrow beam. The second follows from an analysis of the distribution of angle of arrival of Z echoes. It is found at Hobart, with a wave frequency of 4.65 Mc/s, the hole is approximately circular with an angular width to half-power points of less than 0.84°. Under certain circumstances the propagation hole provides a means by which waves can pass completely through an otherwise reflecting ionospheric layer. *Subject Heading:* **1. Ionosphere holes.**—*Author's abstract.*

7.8–111 551.510.535:621.396.8

Hibberd, F. H., **On the observation of ionospheric self-interaction.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):120–122, Feb. 1956. ref. **DWB**—"Self-interaction occurs because the absorption of energy from a wave changes the absorption coefficient of the ionosphere for the wave." There is also interference with other rays. Precautions to avoid misleading results are described. *Subject Heading:* **1. Ionospheric absorption.**—*C.E.P.B.*

7.8–112 551.510.535:621.396:550.385

Hope, E. R., **Spiral patterning of solar corpuscular precipitation.** *Nature*, London, 177(4508):571–572, March 24, **1956.** 2 figs., table, 6 refs. **DWB**—Plots of radio blackout distribution by G.M.T. agree with isochrons of 'morning' maximum of magnetic disturbance in the Arctic. The Russian isochrons (world time) and the isochrons of maximum percent of blackout in summer (G.m.t. and l.m.t.) are shown and discussed. *Subject Headings:* **1. Radio disturbances 2. Geomagnetic disturbances.**—*C.E.P.B.*

7.8–113 551.510.535

†Rawer, Karl (*Service de Prévision Ionospherique Militaire, France*), **Unregelmässigkeit und Regelmässigkeit der sporadischen E-Schicht.** [Irregularity and regularity of the sporadic *E* region.] *Geofisica Pura e Applicata*, Milan, 32:170–224, Sept./Dec. **1955.** 15 graphs, 12 tables, 48 refs., eqs. English summary, p. 170. **DWB, DLC**—From station's observations much information on top-frequency *fEs*, less on blanketing frequency *fbEs* is obtained. The results must be interpretated in statistical terms. Time- and distance-correlation functions are established. Daily, seasonal and geographic regularities are discussed. A sharp maximum exists at the magnetic equator but only for the top-frequency. No well defined influence of the solar cycle has been found, only a very weak one of lunar tides. Besides the routine evaluation, observations of the variation of the reflection coefficient with frequency have been made. In temperate latitudes in about ⅓ of all cases there is no partial reflection; in the other cases local variations of electron concentration up to 1:2 are found, higher values are rare. At low latitudes the variation may be more important. This is found by a qualitative classification of ionograms of different stations. Such classification has been made for transparency, scatter, angle of incidence and layer development. Diffuse echoes exist often near the magnetic equator. *Es* is always vertically sounded at temperate latitudes. In most cases the ionization originates as a thin layer of constant altitude. Transitory phenomena coming downwards are responsible for ≪*E2s*≫ in daytime. It appears that a cumulo-cirrus-cloud layer is a good model for *Es*-ionization. An atmospheric ionization process using stored energy from dissociation or ion existence seems to be most probable. *Subject Heading:* **1. Sporadic E layer.**—*Author's abstract.*

7.8–114 551.510.535

Seaton, M. J., **A possible explanation of the drop in F-region critical densities accompanying major ionospheric storms.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):122–124, Feb. **1956.** 8 refs., 3 eqs. **DWB**—Critical density in F2 in the greatest ionospheric storms may decrease by a factor of at least 100 and there is probably a decrease in the total electron content of the ionosphere. It is suggested that increased turbulent vertical transport of O_2 results in increased recombination; this explanation seems quantitatively sufficient. *Subject Heading:* **1. F2 critical frequency anomalies.**—*C.E.P.B.*

7.8–115 551.510.535:551.590.24

Szendrei, M. E. and McElhinny, M. W., **Preliminary results of the ionospheric solar eclipse of December 25, 1954.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):108–114, Feb. **1956.** 5 figs., table, 9 refs., 6 eqs. **DWB**—Observations of E_1, F_1 and F_2 layers at vertical incidence at Grahamstown, S. Africa during the annular eclipse agree approximately with geometrical obscuration of a solar disk of uniform intensity. *Subject Headings:* **1. Ionospheric variations 2. Eclipse effects 3. Grahamstown, South Africa.**—*C.E.P.B.*

7.8–116 551.510.535:621.396.8:523.8

Wild, J. P. and Roberts, J. A., **The spectrum of radio-star scintillations and the nature of irregularities in the ionosphere.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2):55–75, Feb. **1956.** 17 figs., table, 15 refs. **DWB**—Observations were made at Sydney, Australia, on the radio source in Cygnus, of intensity at one point as a function of time and frequency (40–70 Mc/s), the phase gradient as a function of time, and the intensity at 45 Mc/s at corners of a triangle. Instrumental set-up is described and specimen records shown and discussed. The spectra suggest that most of the irregularities are due to focusing by single lenslike irregularities. The scale-size of structures causing spectral patterns is above 3 km. In some cases random effects predominate, due to finer structure. Degree of fluctuation

shows maxima near midnight (winter) and midday (summer). In many cases the pattern on the ground is very elongated (3 or 4 to 1). Apparent motion was mainly W–E, 80 m/s, in winter, variable in summer. *Subject Headings:* **1. Radio star scintillation 2. Ionospheric structure.**—*C.E.P.B.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Hemispheric numerical integration of barotropic model** (Blackburn, Gates), 7.8–89; **Analysis of met. situation during gale** (Gregor), 7.8–91; **General circulation** (Starr), 7.8–128; **Diurnal temp. wave for bounded eddy conductivity** (Staley), 7.8–155; **Heat balance of wheat field** (Kirillova), 7.8–163.

7.8–117 551.511:551.551:551.554

Baroff, V. B. and Samardzhiev, D. T., **V'rkhu promenite na viat'ra s visochinata pri promenliv koefitsient na vertikalna turbulentna obmiana po modela na B. I. Izvekov.** [Vertical wind variations with variable coefficients of vertical turbulent exchange according to the Izvekov model.] *Bulgarska Akademiia na Naukite, Sofia, Izvestiia, Otdelenie za Fiziko-Matematicheski i Tekhnicheski Nauk, Ser. Fizicheska*, 4:239–248, **1954.** pub. 1955. 3 figs., tables, 7 refs., eqs. **DWB, DLC**—The theory of vertical turbulent exchange is first developed according to the Izvekov formula which calls for a coefficient of turbulent exchange which increases with height. This is applied to the equations of motion and quantitative examples worked out and compared with experimental data, showing good agreement. *Subject Headings:* **1. Wind profile theory 2. Turbulent exchange coefficient.**—*M.R.*

7.8–118 551.511:551.515.11

Estoque, M. A., **The mechanism of vorticity change associated with a selected cyclone.** Chicago Univ. Dept. of Meteorology, Contract AF 19(604)-1293, Technical Report, No. 4, May **1955.** 29 p. 13 figs., 3 tables, 7 refs., 2 eqs. **DWB**—A quantitative estimate of the factors affecting the vorticity changes associated with a storm over the United States is obtained. It is found that the increase of vorticity in the lower troposphere during the formation and subsequent movement of the storm was due mainly to horizontal convergence, while the accompanying intensification of the upper trough was associated with the rotation of the vortex lines toward the vertical. Such rotation of the vortex lines accounted also for a large portion of the negative vorticity changes in the rear of the disturbance throughout the troposphere. *Subject Headings:* **1. Cyclonic vorticity changes 2. Vorticity.**—*A.A.*

7.8–119 551.511:533.2

Keane, A. (*Wollongong Tech. College, Wollongong, N.S.W.*), **The gravitational compression of an elastic sphere.** *Australian Journal of Physics*, Melbourne, 8(1):166–175, March **1955.** 6 refs., 18 eqs. **DLC**—On considering a sphere in hydrostatic gravitational equilibrium, composed of a homogeneous elastic material for which the variation of incompressibility κ with pressure p is given by $d\kappa/dp = n$, a constant, we find that there is an upper bound to the radius R of the sphere provided $n \leqslant 2$, and that for all values of n there is a lower bound to the value of I/MR^2, where I is the moment of inertia about a diameter and M is the mass of the sphere. For a sphere composed of material for which $d\kappa/dp$ is a decreasing function of pressure and $d\kappa/dp \rightarrow 5/3$ as $p \rightarrow \infty$, it emerges that $0{\cdot}40 > I/MR^2 > 0{\cdot}23$ and that the maximum radius is of the order of 10^3 km. *Subject Heading:* **1. Gravitational equilibrium.**—*Author's abstract.*

7.8–120 551.511:551.513.2

Kuo, H.-L., **Energy-releasing processes and stability of thermally driven motions in a rotating fluid.** *Journal of Meteorology*, 13(1):82–101, Feb. **1956.** 6 figs., 4 tables, 17 refs., 84 eqs. **DWB**—This highly mathematical paper examines the effects of rotation and static stability in increasing the resistance to motion of a rotating fluid differentially heated. The potential energy produced by the heating is transformed into kinetic energy by vertical motion associated with the meridional circulation, and by the circulation about the N-S axis. The results of the analysis agree roughly with observation. "These thermally driven disturbances produce a poleward and an upward transport of heat and a downward transport of zonal momentum in the zone of positive vertical shear. . . . This heat transfer is in the direction of

producing and maintaining a stable stratification." *Subject Headings:* **1. Stability of the westerlies 2. Heat transport 3. Energy transport.**—*C.E.P.B.*

7.8–121 551.511

Landers, Holbrook, **On the magnitude of divergence and vorticity.** *Journal of Meteorology*, 13(1):121–122, Feb. **1956.** table, 6 refs. **DWB**—Analyses of 1) wind reports 2000–25,000 ft over eastern U.S.A.; 2) aircraft flights; 3) balloon ascents about 1 mi apart; the separation of the observation points being respectively 200; 16; and 1 mi, gave values of divergence $\times 10^{-5}$/sec as 1.5, 7.8 and 55, and vorticity $\times 10^{5}$/sec as 2.4, 11.8 and 75. *Subject Headings:* **1. Divergence analysis 2. Vorticity computations.**—*C.E.P.B.*

7.8–122 551.511:535.3

Long, Robert R., **Long waves in a two-fluid system.** *Journal of Meteorology*, 13(1):70–74, Feb. **1956.** 5 figs., 7 refs., 30 eqs. **DWB**—The differential equations governing the unsteady motion of a system of two superimposed liquids are integrated by use of the method of characteristics. The solution differs significantly from that obtained by assuming a very thin lower layer. If the basic shear across the interface is small, a wave breaks forward (as an ordinary water wave) only if the amplitude is fairly small and if the lower layer is thinner than the upper layer. If the upper fluid is thinner, the wave breaks backward. The speed of the various points of the wave does not vary monotonically with amplitude. If a shear exists, higher velocities in the upper layer in the direction of wave propagation favor the forward breaking of a wave. The opposite shear may cause a wave to break backward. *Subject Heading:* **1. Wave motion in the atmosphere.**—*Author's abstract.*

7.8–123 551.511:551.513.1:551.587

Watanabe, T., **Normal fields of divergence and convergence of the integrated atmosphere for the Northern Hemisphere.** *Journal of Meteorological Research*, Tokyo, 7(3):125–131, March **1955.** 16 figs., 3 refs., eqs. In Japanese; English summary p. 125. **DWB**—Making use of a simple relation, derived in a previous paper expressing the divergence and convergence of the integrated atmosphere as a function of the 500-mb height and surface pressure, fields of divergence and convergence are constructed on normal weather chart published by U. S. Weather Bureau. This computation of divergence is performed by a graphical method. These fields of divergence and convergence are related to area of divergence and convergence at 10,000 feet after J. Namias and P. F. Clapp and monthly mean divergence field in Jan. 1952, after the author. Some kinematical features of displacement of area of divergence of an integrated atmosphere are pointed out. *Subject Headings:* **1. Convergence and divergence 2. Upper air climatology 3. Northern Hemisphere.**—*Author's abstract.*

7.8–124 551.511:533.7

White, Robert M. and Cooley, Duane S., **Kinetic-energy spectrum of meridional motion in the mid-troposphere.** *Journal of Meteorology*, 13(1):67–69, Feb. **1956.** 4 figs., 5 refs., 7 eqs. **DWB**—The kinetic energy spectra were computed daily at 500 mb for every 10° long in 45°N, Dec. 1949 through Feb. 1950. At least 2 maxima were always found, centered around wave numbers 4 and 8. This suggests that there are two types of large-scale disturbance, long planetary waves and rapidly moving transient disturbances. *Subject Heading:* **1. Kinetic energy in atmosphere.**—*C.E.P.B.*

GENERAL CIRCULATION

See also: **Hemispheric numerical integration of barotropic model** (Blackburn, Gates), 7.8–89; **Dynamic forecasting methods** (Brandejs), 7.8–90; **Energy-releasing processes** (Kuo), 7.8–120; **Normal fields of divergence and convergence** (Watanabe), 7.8–123; **"Siberian" Feb., 1956** (Rodewald), 7.8–161.

7.8–125 551.513:551.465

Rossby, C.-G. (*Univ. of Chicago and Univ. of Stockholm*), **A comparison of current patterns in the atmosphere and the ocean basins.** *International Union of Geodesy and Geophysics*,

Association of Meteorology, Brussels, 1951, Procès-Verbaux des Séances, Mémoires et Discussion, pub. **1953.** p. 9–30. 14 figs., 19 refs. **DWB**—Recent achievements in the understanding of the general atmospheric and oceanic circulation, based on extensive new observations and theoretical developments, are outlined. Among the topics discussed are: the effect of the Coriolis force in determining the circulation pattern in the oceans, MUNK's analysis as compared with actual currents, the success of numerical weather prediction based on the vorticity concept, jet streams in the atmosphere and similar currents in the oceans, meandering of these currents, formation of "cut-offs" in both media, multiple jets and the effect of eddies. The article is written for general understanding without mathematical treatment. *Subject Headings:* **1. General circulation 2. Oceanic circulation 3. Jet stream 4. Coriolis force 5. Gulf Stream.**—*A.A.*

7.8–126 551.513:551.543

Rubin, Morton J. (*U.S.W.B., Wash., D. C.*), **An analysis of pressure anomalies in the Southern Hemisphere.** *South Africa. Weather Bureau, Notos,* 4(1):11–16, **1955.** 8 figs., 2 tables, ref. **DWB**—The Southern Hemisphere atmospheric circulation is relatively simple in structure; it is primarily zonal. Certain similarities exist between the seasonal shifts of the zonal pressure systems on the hemispherical scale and in the localized region of the west coast of South America. On a hemispherical scale the pressure variations at 40°S appear to be related to the shifts in latitude of the subtropical belt of high pressure and the subpolar zone of low pressure. Similar seasonal shifts are found in the region of the west coast of South America, and here the pressure change at 38°S is related to changes both polewards and equatorwards of that latitude. The winter-time southern oscillation appears to be related to changes in pressure in the subtropical zone, but not to contemporary precipitation in that same zone. A sharp distinction exists between the pressure patterns on the west coast of South America during the 1911–1940 and 1941–1952 periods. Anomalous pressure patterns in each period are related to anomalous precipitation patterns. Individual monthly patterns are found in each period that correspond to the mean of the other period. These are the exceptions, and are related to large-scale variations from the mean. *Subject Headings:* **1. Pressure anomalies 2. Zonal circulation 3. Southern Hemisphere.**—*Author's abstract.*

7.8–127 551.513.1

Frenzen, Paul and LaSeur, N. E., **Criteria for the occurrence of an eccentric circumpolar vortex in the atmosphere inferred from model experiments.** *Journal of Meteorology,* 13(1): 124–126, Feb. **1956.** fig., 7 refs. **DWB**—Referring to LASEUR's paper **On the asymmetry of the middle-latitude circumpolar current** (*see* 5.7–87, July 1954, *MAB*), FRENZEN develops further the analogy with model flow patterns past a barrier found by R. R. LONG (*see* 4.2–102, Feb. 1953, *MAB*). LASEUR discusses in further detail the large-scale patterns caused by the Rockies and Himalayas and interaction with heating effects. FRENZEN comments further. *Subject Heading:* **1. Zonal circulation.**—*C.E.P.B.*

7.8–128 551.513:551.511

Starr, Victor P., **Essay on the general circulation of the earth's atmosphere.** *Journal of Meteorology,* 5(2):39–43, April **1948.** 3 figs., 5 refs. (Also in: Massachusetts Institute of Technology. Dept. of Meteorology, Contract AF 19(122)-153, **Studies of the Atmospheric General Circulation, Final Report, Pt. 1,** May 31, **1954.** p. 8–12.) **DWB**—The course of the normal transfer of absolute angular momentum from the belts of easterlies near the equator to the belts of surface westerlies in middle latitudes is studied. It is suggested that the horizontal transfer is brought about by the large-scale troughs and ridges in the mid-troposphere, which are adapted to perform this function by their departure from sinusoidal form. Also, the shapes of the subtropical circulations are found to be such as to produce a transport of angular momentum poleward. It is proposed that the downward flow of angular momentum in the westerly belts is effected by the presence of surface cyclones of the Bjerknes type in these regions. The upward flow in the easterly belts is assumed to be effected through some analogous mechanism, although the details are not clear owing to the scarcity of proper observational data. *Subject Headings:* **1. General circulation 2. Angular momentum transfer.** —*Author's abstract.*

7.8–129 551.513.1:551.57

*Starr, V. P. and White, R. M., **Balance requirements of the general circulation.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 35, Dec. **1954.** 57 p. 29 tables. (Also in: Massachusetts Institute of Technology. Dept. of Meteorology. Contract AF 19(122)-153, **Studies of the Atmospheric General Circulation, Final Report Pt. 1,** May 31, **1954.** p. 186–242. 29 tables, 32 refs., fig., eq. **DWB**)—Data for the year 1950 from key stations around the world at latitude 13°, 31°, 42.5°, 55° and 70°N are used to obtain a quantitative measure of the balance of: a) angular momentum, b) water vapor and c) energy. Poleward flux of eastward angular momentum is obtained from wind data extending up to 100 mb and from tropics to polar regions and it is concluded that large-scale eddies provide most of this flux, with maximum at 30°N. These eddies account for most of the water vapor and energy transport. Extensive tables appended give details of energy and momentum balance calculations. *Subject Headings:* **1. General circulation balance 2. Angular momentum balance 3. Water vapor transport balance 4. Northern Hemisphere** —*M.R.*

7.8–130 551.513.2:551.54

Vowinckel, E., **Southern Hemisphere weather map analysis: five-year mean pressures. Pt. 1.** *South Africa. Weather Bureau, Notos*, 4(1):17–50, **1955.** 3 figs., 4 tables, 15 maps, 5 refs. *Also:* **Pt. 2.** *Ibid.*, 4(3):204–216, **1955.** 17 figs., 5 tables, 13 refs. **DWB**—Pt. 1 is a critical study of five-year means of pressure for the Southern Hemisphere, as derived from daily analyzed weather maps for the period from 1949 to 1953. This reveals that these values, in general, are fairly reliable for the summer months, but that for the remainder of the year the values for the higher latitudes are much too high. Tables of monthly gridpoint pressure means are given for southern Africa, at the 1250-gpm level, and for the hemisphere at sea level; charts of mean monthly sea level pressure are also included. In Pt. 2, the five year means of pressure for the Southern Hemisphere are used to study the general circulation of the Southern Hemisphere in terms of the seasonal and geographical distribution of mean monthly pressure. *Subject Headings:* **1. Atmospheric circulation 2. Southern Hemisphere map analysis 3. Pressure distribution 4. Southern Hemisphere.**—*Author's abstracts.*

ATMOSPHERIC DISTURBANCES

See also: **Power of a breaker** (Rodewald), 7.8–33; **Three-front model,** 7.8–86; **Cold-air outbreak** (Ōtsuka), 7.8–87; **Vorticity change associated with cyclone** (Estoque), 7.8–118; **Fronts and frontal waves in atmos. models** (Faller), 7.8–136; **Weather situation with convection in mid-stratosphere** (Raale), 7.8–186; **Precip. in Bohemia and synoptic situation** (Rein), 7.8–208.

7.8–131 551.515

Roulleau, J., **L'évolution du temps.** [Evolution of weather.] *La Météorologie*, 4th Ser., No. 35:209–220, July/Sept. **1954.** 13 figs., ref. **DWB**—A review of classical ideas of air masses, fronts, disturbances, frontolysis or cyclolysis, cyclogenesis, pressure changes and cloud systems in cyclones, families of cyclones, centers of action and, finally, a discussion accompanied by typical synoptic charts, of the 9 main types of weather in Western Europe: 1) anticyclonic type, 2) easterly anticyclone, 3) southerly anticyclone, 4) westerly anticyclone, 5) westerly cyclone, 6) westerly with secondary in Mediterranean, 7) easterly storm, 8) air mass thunderstorm and 9) stationary frontal squall thunderstorm (trough). *Subject Headings:* **1. Atmospheric disturbances 2. Weather types 3. Western Europe.**—*M.R.*

7.8–132 551.515.4(265/6)

Ruttenberg, S. and Schilling, G. F., **Beobachtungen von Nachtgewittern über dem Pazifischen Ozean.** [Observation of night storms over the Pacific Ocean.] *Wetter und Leben*, Vienna, 6(5/6):109–113, Aug. **1954.** fig., 6 refs. **DWB**—The atmospheric electricity program of the Capricorn Expedition sponsored by the Scripps Foundation is described briefly. In the region covered by the expedition, the Central Pacific between 32°N and 26°S lat. and 110°W and 178°E long., the total intensity and frequency of storms is lower than in con

tinental regions of low latitudes. The total storm activity in these regions does not contribute significantly to maintaining the electric potential of the ionosphere. *Subject Headings:* **1. Storms at sea 2. Nocturnal storms 3. Pacific Ocean.**—*I.L.D.*

7.8–133 551.515:551.461.2(431)

§Tomczak, Gerhard, **Die Sturmfluten vom 20. bis 24. Dezember 1954 bei Cuxhaven.** [The storm surges of Dec. 20–24, 1954 near Cuxhaven.] *Deutsche Hydrographische Zeitschrift*, Hamburg, 8(4):145–156, **1955.** 23 figs., 4 tables, 8 refs. German, English and French summaries p. 145. **DWB**—Gales (force 8–10) blew at German lightships for 34% of the time. Hourly values are given of wind, water level and excess of water level over normal tides; the excess at times exceeded 3 m. The observed excesses generally agree with those calculated from the wind, plus a correction for North Sea surges. The storm surges were due to the passage of a trough over the German Bight at or just before high water. Synoptic charts are shown at intervals of a few hours from 16 h on Dec. 21 to 16 h on Dec. 25. *Subject Headings:* **1. Storm surges 2. Cuxhaven, Germany.**—*C.E.P.B.*

7.8–134 551.515.1

§Rodewald, M., **Einseitige Sturmzyklonen.** [Asymmetrical storm cyclones.] *Wetterlotse*, Hamburg, No. 96:1–6, Jan. **1956.** 3 figs. **DLC**—Illustrations of depressions with weak pressure gradients on one side and storm winds on the other. On Oct. 22, 1955, northerly gales occurred west of an occlusion to a depression in the North Sea, with a warm sector in the NE. A similar situation turned through 90° gives E gales south of Iceland. A rarer type of northerly gales, for which warnings were issued, occurred on the German coast on Jan. 17, 1955, behind a depression with central pressure below 965 mb. *Subject Heading:* **1. Depressions.**—*C.E.P.B.*

7.8–135 551.515.1:551.589.5(82)

§Schwerdtfeger, Werner, **Análisis sinóptico y aspecto climatológico de dos distintos tipos de depresiones báricas en el norte de la Argentina.** [Synoptic analysis and climatological aspect of the distinct types of baric depressions in Northern Argentina.] *Meteoros*, Buenos Aires, 4(4):301–323, Oct./Dec. **1954.** 9 figs., 7 tables, 10 refs., eq. Spanish and English summaries p. 301. **DWB**—The author analyzes a characteristic example of each of the two types of cyclones which are found over Northern Argentina. The first type is a cyclone whose formation is associated with the existence of a pronounced upper air trough and the presence of humid tropical air masses in the lower layers over the northeastern provinces. Extensive precipitation results from the intensification of these pressure systems. Certain analogies to the European V-b storms are shown. The other type is the "thermal low" characteristic of the summer pressure pattern of northwest Argentina. These depressions, as a result of the high mean temperatures (also mean vertical temperatures) which exceed considerably those of south Brazilian stations studied at the same altitude, are shallow and disappear at the 3000 m level; but because of their semipersistence they have considerable repercussions on the wind regime in the lower layer of adjacent zones and on the formation of summer rainfall in the northeast. *Subject Headings:* **1. Barometric depressions 2. Synoptic analysis 3. Upper air climatology 4. Northern Argentina.**—*Based on author's abstract.*

7.8–136 551.515.11:551.515.8

Faller, Alan J., **A demonstration of fronts and frontal waves in atmospheric models.** *Journal of Meteorology*, 13(1):1–4, Feb. **1956.** 4 figs., 4 refs. **DWB**—A rotating dish 3 cm deep was cooled from below at the center and heated from above near the edge. Motion at the top was shown by floating particles and at the bottom by trails from crystals of dye. Regions of convergence at the bottom and upward motion were shown by concentrations of the dye. Fronts and associated wave cyclones are shown in photos and explanatory diagrams. *Subject Headings:* **1. Fronts 2. Frontal waves.**—*C.E.P.B.*

7.8–137 551.515.11(4)

Ozorai, Zoltán, **Két gyorsvonulású ciklon Európa fölött.** [Two fast-moving cyclones over Europe.] *Időjárás*, Budapest, 59(1):55–58, Jan./Feb. **1955.** 3 figs. **DLC**—The tracks of two fast-moving cyclones are analyzed on synoptic surface and upper air charts. The two

cyclones followed each other in close succession and caused major disasters over sea and lan areas of western and central Europe. The behavior of the cyclones confirms basic theory o cyclonic circulation. *Subject Headings:* **1. Cyclone movement 2. Cyclone tracks 3. Europe** —*G.T.*

7.8–138 551.515.1

Spar, Jerome and Petterssen, S., **Comments on "A general survey of factors influencin development at sea level."** *Journal of Meteorology*, 13(1):123–124, Feb. **1956.** 2 refs 10 eqs. **DWB**—Commenting on PETTERSSEN's paper (*see* 6.5–124, June 1955, *MAB*), SPA derives SUTCLIFFE's development equation from statical considerations instead of dynamic PETTERSSEN replies that it makes no difference. *Subject Headings:* **1. Cyclogenesis 2. Sut cliffe's development theory.**—*C.E.P.B.*

7.8–139 551.515.11(266

Winston, Jay S. (*U.S.W.B., Wash., D. C.*), **Physical aspects of rapid cyclogenesis in th Gulf of Alaska.** *Tellus*, Stockholm, 7(4):481–500, Nov. **1955.** 10+figs., table, 28 refs 9 eqs. **DWB, DLC**—The Gulf of Alaska is often the site of rapid development of large-scal cyclonic activity which can have profound effects on the long-wave pattern over North Americ in a matter of 24 to 48 hrs. During much of the year such cyclogenesis takes place in th presence of a large heat source associated with rapid modification of cold Arctic air masse moving from Alaska out over the warmer sea surface of the Gulf. In order to get some insigh into the mechanism of cyclogenesis under these special conditions a case of intense developmen occurring early in Feb. 1950 has been studied, mainly in terms of the vorticity equation The effects of barotropic redistribution of vorticity seem to account for much of the develop ment. However, it is found that there exist pronounced fields of divergence and vertica motion, which particularly at the time of most rapid development reflect the influence of hea sources on the circulation. *Subject Headings:* **1. Cyclogenesis 2. Gulf of Alaska.**—*Author' abstract.*

7.8–140 551.515.2(263

Gentry, Robert C. (*U.S.W.B., Wash., D. C.*), **The 1955 hurricane season.** *Weatherwise* Boston, 9(1):11–13, 29–31, Feb. **1956.** fig., ref. **DWB**—The 13 tropical storms (including hurricanes "Alice" to "Katie") of 1955 in the western Atlantic and Caribbean are listed and shown on track chart, and each separate storm is discussed in some detail. *Subject Headings* **1. Hurricanes, 1955 2. Western Atlantic 3. Gulf of Mexico.**—*M.R.*

7.8–141 551.515.2(86

Hurricane Janet. *British Honduras Gazette*, Belize, Supplement, No. 9, Oct. 29, **1955.** 2 p. Also: **Hurricane Janet in British Honduras.** *Ibid.*, No. 10, Oct. 29, **1955.** 2 p. **DWB** —Hurricane "Janet" on Sept. 28, 1955, hit Corozal, the capital of the northernmost district of British Honduras, completely destroying the town and surrounding villages, a sugar factory at Sarteneja and crops, plantations and small craft. At least 10,000 persons were left homeless and 15,000 put out of work. These bulletins outline the steps being taken at the time to provide immediate and long-term relief. *Subject Headings:* **1. Hurricane damage 2. Hurricane relief 3. Hurricane "Janet" (1955) 4. Corozal, British Honduras.**—*M.R.*

7.8–142 551.515.2(08

Symposium on typhoons held at Tokyo, Japan from November 9 to 12, 1954. *Indian Journal of Meteorology and Geophysics*, Delhi, 6(1):66–67, Jan. **1955. DWB, DLC**—The countries and organizations participating in the symposium (organized by UNESCO), subjects discussed and recommendations to be brought to the attention of the WMO are listed. *Subject Heading:* **1. Typhoon symposia.**—*I.L.D.*

7.8–143 551.515.23(261

Rodewald, M., **Die tückische Edith.** [Tricky Edith.] *Wetterlotse*, Hamburg, No 96:9–15, Jan. **1956.** 5 figs. **DLC**—The "Liselotte Essburger," Rotterdam–New York, in Aug./Sept. 1955, encountered "Edith" several times, in spite of avoiding action, because o

the hurricane's looped track. The track of hurricane, course of ship, synoptic chart, and upper winds are shown. The role of the "steering high" and cold front are shown. *Subject Headings:* **1. Hurricane tracks 2. Hurricane "Edith" (1955).**—*C.E.P.B.*

7.8–144 551.515.4:551.515.8(54)

§Desai, D. N. and Rao, Y. P. (*Region. Met. Centre, Bombay*), **On the cold pools and their role in the development of Nor'westers over West Bengal and Eastern Pakistan.** *Indian Journal of Meteorology and Geophysics*, Delhi, 5(3):243–248, July **1954.** 6 figs., 4 refs., 2 eqs. **MH-BH**—The authors attempt to check the usefulness of the empirical rules of RAMASWAMI and BOSE (1953) (*see* 6.1–100 Jan. 1955, *MAB*) for forecasting thunderstorms in the Bengal and east Pakistan area. Conditions on night of March 13, May 2, and May 9, 1953 are analyzed and thickness charts presented to show cause of thunderstorm development. It is concluded that temperatures were sometimes falling and sometimes rising before occurrence of northwesters, that thunderstorms were not confined to cold pools or troughs, but occurred extensively in areas of thermal high or straight thickness lines and hence the final determining factor in outbreak of northwesters is not necessarily the advection of cold air at upper levels. *Subject Headings:* **1. Cold vortexes 2. Thunderstorm forecasting 3. Northwesters 4. East Pakistan 5. West Bengal.**—*M.R.*

7.8–145 551.515.4:551.515.8(261)

Rodewald, M., **Gewitterwellen an einer Kaltfront südwestlich der Azoren (19. Januar 1955).** [Thunderstorm waves at a front SW of the Azores, 1.19.55.] *Wetterlotse*, Hamburg, No. 83:34–37, Feb. **1955.** 2 figs. **DLC**—A radar picture shows wavy StCu. It gave showers, squalls and lightning. A weather chart is given, showing a cold front along the course of the ship. The thunder was pre-frontal. *Subject Headings:* **1. Cold front thunder 2. North Atlantic.**—*C.E.P.B.*

7.8–146 551.515.4(54)

*Srinivasan, V. (*Regional Met. Centre, Bombay*), **Thunderstorms in Kutch-Saurashtra.** *Indian Journal of Meteorology and Geophysics*, Dehli, 5(3):249–252, July **1954.** 6 tables. **MH-BH**—Thunderstorm data for 5 stations in the Cutch-Saurashtra district of western India are analyzed in a number of ways to give an idea of: 1) the frequency in different months, 2) at different times of day, 3) of different durations, 4) with various synoptic types, 5) direction and distance of lows and 6) accompanying weather conditions (rain intensity). Most thunderstorms are in association with low pressure systems or strengthening of the monsoon. *Subject Headings:* **1. Thunderstorm frequencies 2. Thunderstorm data 3. Synoptic climatology 4. Cutch-Saurashtra, India.**—*M.R.*

7.8–147 551.515.8:576.8

Kiss, István, **A nem sejtes élő anyag időérzékenységéről.** [Weather sensitivity of noncellular living substances.] *Időjárás*, Budapest, 59(1):29–34, Jan./Feb. **1955.** 4 figs., refs. Russian and French summaries p. 29. **DLC**—The term *hyperfragments* is suggested for certain particles of noncellular plasma originating from the decomposition of primitive cellular organisms. Hyperfragments are capable of propagation. Three instances of a remarkable multiplication of hyperfragments are related, all three cases being connected with prefrontal weather situations. A similar effect of prefrontal situations on the propagation of cellular microorganisms has been widely established before. *Subject Headings:* **1. Microorganisms 2. Prefrontal effects 3. Weather sensitivity.**—*G.T.*

7.8–148 551.515.8:551.553.8(267.5)

Rodewald, M., **Böenfronten im Roten Meer und im Mittelmeer.** [Squall fronts on the Red Sea and Mediterranean.] *Wetterlotse*, No. 87:92–98, May **1955.** 3 figs. **DLC**—Account of a line squall in the Red Sea on Dec. 20, 1954 with weather chart and explanation. A map of the boundary of the NW wind in the Red Sea in different months is given. On Dec. 23 the same ship met another line squall in the Mediterranean. *Subject Headings:* **1. Line squalls 2. Red Sea.**—*C.E.P.B.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Nocturnal heat exchange of frozen glacier surface** (Ambach), 7.8–40; **Symposium on solar energy, wind power,** 7.8–47; **Sunny weather, July 1955** (Booth), 7.8–58; **Barometer effect on hard cosmic radiation component** (Trefall), 7.8–102; **Resonance absorption of sunlight** (Donahue, Resnick), 7.8–257.

7.8–149 551.521.1:551.501.

Buscaglia, Domenico, **Valutazione pratica dell'energia solare incidente su una superfici qualsiasi.** [Practical evaluation of the solar energy incident on surfaces of any orientation.] *Geofisica e Meteorologia*, Genoa, 3(4/5):115–125, July/Oct. **1955.** 3 figs., 18 refs., eqs. **DWB**—The author develops a procedure for evaluating the amount of direct solar radiation inciden upon any surface from the point of view of determining the integral of the mean effectiv insolation $Qe = \int_s \int_T \phi_e dt ds$ (ϕ—intensity of insolation, T—day, month and year). Th solution of the double integral, the necessary experimental data for calculating ϕ, the calculation of duration of insolation by algebraic and graphical means, the calculation of the intensity o insolation, the calculation of Q_T and Q, etc. are discussed. *Subject Heading:* **1. Solar radiation calculations.**—*I.L.D.*

7.8–150 551.521.4

Seaton, M. J., **On the extinction correction used in the determination of airglow emission heights by the van Rhijn method.** *Journal of Atmospheric and Terrestrial Physics*, 8(1/2) 115–116, Feb. **1956.** table, 4 refs., 2 eqs. **DWB**—The extinction ratio I(75°)/I(0°) is calculated for pure absorption and isotropic scattering (exact and approximate solutions). *Subject Heading:* **1. Airglow.**—*C.E.P.B.*

7.8–151 551.521.7:551.510.535

†Elwert, Gerhard (*Astron. Inst., Tübingen Univ.*), **Über die Bedeutung einer weichen Röntgenstrahlung der Sonnenkorona für die Bildung der normalen ionosphärischen E-Schicht.** [The effect of soft X-rays from the solar corona on the formation of the normal ionospheric *E*-layer.] *Journal of Atmospheric and Terrestrial Physics*, London, (1/2):68–77, **1953.** 6 figs., table, 26 refs., 3 eqs. **DWB**—This continues a paper in which the author (1953) calculated the radiation of the solar corona in the spectral region of soft X-rays, as reported in Pt. I. In Pt. II, the effect of that radiation in the earth's atmosphere is studied, in particular the height at which the radiation is absorbed, and the number of electrons in case of equilibrium between ionization and recombination. The results obtained agree well with the normal E layer. *Subject Headings:* **1. Ionospheric electron density 2. Solar X-radiation.**—*Author's abstract.*

7.8–152 551.521.63:551.586

Schulze, R., **Der Wert der UV-Bestrahlung unserer Kinder und Bergleute.** [The value of UV-radiation for our children and mountaineers.] *Umschau*, 56(5):144–146, March **1, 1956.** 6 figs. **DLC**—UV radiation is the most certain cure for skin and bone tuberculosis and for rickets. As the sun is not always available, artificial sources and their effects in Hamburg are illustrated. *Subject Heading:* **1. Ultraviolet radiation effects.**—*C.E.P.B.*

7.8–153 551.521.64:537.59

Heymann, F. F. and Williams, W. F., **Multiple scattering of electrons and positrons in nuclear emulsions.** *Philosophical Magazine*, London, 8 Ser., 1(2):212–220, Feb. **1956.** 5 figs., 3 tables, 15 refs. **DWB**—Plates were exposed under nearly identical conditions to electrons and positrons of the same energy (1–3 MeV). The difference between multiple scattering of electrons and positrons at 2.5 MeV was larger than predicted by theory. *Subject Heading:* **1. Cosmic ray research.**—*C.E.P.B.*

7.8–154 551.521.64

Waddington, C. J., **The interactions of cosmic ray alpha-particles.** *Philosophical Magazine*, London, 8 Ser., 1(1):105–108, Jan. **1956.** 2 figs., 5 refs. **DWB**—Nuclear disintegrations

due to α-particles were observed in stacks of emulsions exposed by balloon. A new model nucleus is deduced. *Subject Heading:* **1. Cosmic ray showers.**—*C.E.P.B.*

TEMPERATURE OF THE AIR

See also: **Wet-bulb temp., Aberdeen and Eskdalemuir** (Thomson), 7.8–13; **Wind machines for frost protection** (Firth), 7.8–48; **Atmos. pressure correction of radiosonde due to temp.** (Groafen, Pauly), 7.8–78; **Radiation and lag corrections to temp. measured with radiosonde** (Scrase), 7.8–79; **Weathering, preservation of stone buildings** (Schaffer), 7.8–100; **Upper atmos. wind and sonic velocity** (Groves), 7.8–280.

7.8–155 551.524.31:551.551:551.511

Staley, Dean O., **The diurnal temperature wave for bounded eddy conductivity.** *Journal of Meteorology*, 13(1):13–20, Feb. **1956.** 6 figs., table, 20 refs., 18 eqs. **DWB**—Theoretical expressions for the variation of eddy conductivity K with height, and some practical determinations are discussed, including diurnal variation. The diurnal temperature wave from 0–200 m is calculated, the lower boundary temperature being represented by a single cosine term, for K constant in time and either increasing linearly with height, constant, and increasing or decreasing exponentially. A solution for increasing but bounded K agrees with observations better than previous solutions. *Subject Headings:* **1. Diurnal temperature variations 2. Eddy conductivity.**—*C.E.P.B.*

7.8–156 551.524.3:551.513

Krueger, Arthur F. (*U.S.W.B., Wash., D. C.*), **The weather and circulation of April 1955: another cold month in the West.** *Monthly Weather Review*, Wash., D. C., 83(4):95–97, April **1955.** 3 figs. **DWB**—The 1000-700 mb thickness chart for April 1955 shows cold pools in the Far West (−140), Alaska (−190), south of Greenland (−110), and over Western Europe −270) and warm domes between the Rockies and East Coast (+210) and over Iceland (+150). The result was cold weather for the 5th consecutive month in the Far West, but a change to above normal temperature in the Middle West and Central Canada and very cold weather in Europe. Precipitation was well above normal in the Far West—in some places over 300% of normal. The Southwest and Plains continued very dry. Other features of the weather and circulation are described and illustrated. *Subject Headings:* **1. Cold springs 2. Drought, Southwestern United States (1955) 3. Record rainfall 4. Atmospheric circulation anomalies 5. Western United States.**—*M.R.*

7.8–157 551.524.34(4)

Schreyer, Richard, **Kleine Analyse mitteleuropäischer Monatstemperaturen 1761–1950.** [Brief analyses of monthly temperature in Central Europe, 1861–1950.] *Wetter und Leben*, Vienna, 7(5/6):125–126, **1955.** ref. **DLC, DWB**—This article is a summary of a study by Gerhard Schindler, in *Annalen der Meteorologie* (6(7/8), 1953–54; *see* 6.7, July 1955, *MAB*), of the work of Dammann (rev. ed. Pt. 2 of Linke's **Taschenbuch**) on temperature observations at De Bilt, Berlin and Vienna from 1761 to 1950. The temperature changes in each month are summarized. *Subject Headings:* **1. Long period records 2. Temperature trends 3. Europe.**—*I.L.D.*

7.8–158 551.524.35

*Røstad, Anton, **On long range temperature waves in Europe.** Oslo, Akademisk Forlag, **1955.** 75 p. tables, 53 figs. **DWB**—The author presents a detailed analysis of long period temperature records for 23 stations in Europe from 1706–1950 (De Bilt) or for somewhat shorter periods, but all for over 130 years. The elaborate method of smoothing actual data for each year and that for the 3, 9 and 27 yr periods centered in the mid-point of the period, graphs of the "cycles" obtained by these smoothing methods at each station, and charts showing time amplitude, intensity and duration of the "waves" of colder or warmer weather which move from northern to central or southern Europe over a period of several years are treated. Finally, there is a discussion of the temperature trends in the various eras from 1740 to 1950 which show up in this study. *Subject Headings:* **1. Temperature waves 2. Long period records 3. Smoothing techniques 4. Europe.**—*M.R.*

7.8–159 551.524.3

Bruce, W. J. and Richardson, W. E., **Night cooling under clear skies.** *Meteorological Magazine*, London, 85(1005):90–91, March **1956.** 2 figs., 3 refs. **DWB**—Bruce pointed out that several recent papers show a levelling off in March–April of the retardation of the discontinuity in evening cooling. He attributed this to changes of soil moisture and vegetation. Richardson discussed the implications of the curve and remarked that minimum temperatures do not fall below 15°F in Britain when no snow is lying. *Subject Headings:* **1. Nocturnal cooling 2. Great Britain.**—*C.E.P.B.*

7.8–160 551.524.36:551.584.31(424)

Lawrence, E. N., **Minimum temperatures and topography in a Herefordshire valley.** *Meteorological Magazine*, London, 85(1005):79–83, March **1956.** 4 figs., 3 tables, 4 refs. **DWB**—At Long Orchard, Much Birch, near Hereford, 8 minimum thermometers were exposed 4 ft above ground in the banks and trough of a valley. The lay-out is shown with photos. Mean and extreme temperatures are given weekly, April 2–May 27, 1954. Bank sites averaged 0.8°F warmer and had a smaller spread than trough sites. The nature of the crops also affected the minima. *Subject Headings:* **1. Minimum temperatures 2. Topographic effects 3. Herefordshire, Eng.**—*C.E.P.B.*

7.8–161 551.524.37:551.513

§Rodewald, Martin, **Welche meteorologischen Besonderheiten führten zum "sibirischen" Februar 1956?** [What meteorological peculiarities led to the "Siberian" February of 1956?] *Umschau*, 56(6):164–166, March 15, **1956.** 5 figs. **DLC**—The severe winter was due to an anticyclone over N. Europe bringing easterly winds. This resulted from a transference in the upper air from tropical to circumpolar regions. The prehistory of 8 earlier severe winters shows an anticyclone moving in from the subtropical N. Atlantic (e.g. 1928–9). The development is related to the outflow from a warm anticyclone over an abnormally warm Gulf Stream in the N. Atlantic, becoming blocked over the coastal regions of Europe and inducing a N wind. The ultimate cause may have been a sunspot maximum. *Subject Headings:* **1. Severe winters 2. Atmospheric circulation anomalies 3. Europe.**—*C.E.P.B.*

7.8–162 551.524.37(71)

*Thomas, Morley K. and Boyd, Donald W. (*Climatology Sec., Canadian Met. Serv.*), **Winter design temperature data for sixty-six Canadian stations.** *National Research Council of Canada. Division of Building Research, Building Note*, No. 14, Sept. **1954.** 3 p. tables. **DWB**—Elevation, period of record (mainly 1921–50), lowest temperature of period, mean annual minimum temperature, winter design temperatures for 1%, 2½%, 5% and 10% of cases, and mean winter wind speed (mph) are tabulated. Winter design temperatures are for Jan. 1941–50, winter wind speeds for Dec.–Jan. and Feb. 1941–1947. Stations are arranged by provinces. *Subject Headings:* **1. Winter design temperatures 2. Extreme minimum temperatures 3. Canada.**—*M.R.*

7.8–163 551.524.4:551.511:633.11

Kirillova, T. V., **Teplovoĭ balans polia pshenitsy.** [Heat balance of a wheat field.] *Meteorologiia i Gidrologiia*, No. 2:30–32, March/April **1955.** fig., table, ref., 2 eqs. **DLC**—The heat balance of fields of summer wheat situated in the Northern Crimea was studied by taking actinometric observations and measuring the temperature and humidity gradient from April 29 to July 2, 1953 at 6–7, 9–10, 12–13, 15–16 and 18–19 h. A table giving temperature and humidity values for irrigated and nonirrigated fields for three days and a diagram showing the daily heat totals constituting the heat balance are presented. The heat of evaporation (L_E) was calculated by the formula $L_E = \frac{R-Q}{1+0.64\frac{Dt}{De}}$ and the turbulent exchange (p) by $p = \frac{R-Q}{1-0.56\frac{Dt}{De}}$; Dt and De are the difference in temperature and boundary between 0.2

and 1.5 m; R, radiational balance and Q, heat flow into the soil. *Subject Headings:* **1. Heat balance 2. Soil-air heat exchange 3. Northern Crimea.**—*I.L.D.*

7.8–164 551.524.7:551.507.352

Durbin, W. G., **Some further determinations made by the M.R.F. of the speed correction coefficients of aircraft thermometers.** *Great Britain. Meteorological Research Committee, M.R.P.* 930, Dec. 8, **1955,** 12 p. 4 figs., 2 tables, 5 refs., 8 eqs. Mimeo. **DWB**—Speed correction coefficients were made of flat plate and conical head thermometers mounted under a wing of an Ashton aircraft and under the nose of a Canberra, at speeds of 108–280 kn and heights of 5000–35,000 ft. No evidence was found of systematic variation of the coefficient with height. Values for the Ashton and Canberra aircraft were 1.83 and 1.76 respectively for the flat plate, 2.01 and 1.92 with the conical head. The correction coefficients for existing Met. Research Flight thermometers are assessed. *Subject Heading:* **1. Airplane thermometer corrections.**—*C.E.P.B.*

7.8–165 551.524.7:551.507.362

Ference, M., Jr.; Stroud, W. G.; Walsh, J. R. et al., **Measurement of temperatures at elevations of 30 to 80 kilometers by the rocket-grenade experiment.** *Journal of Meteorology,* 13(1):5–12, Feb. **1956.** 7 figs., 2 tables, 41 refs., 6 eqs. **DWB**—Aerobee rockets ejected and exploded grenades at several predetermined intervals at White Sands, N. Mexico; explosions were photographed and arrival of sound waves at a microphone timed. The method of analysis, taking account of winds, is set out. Results of 6 ascents are given in a table and graphs. They showed no clear cut diurnal or seasonal variation but some irregularities. Two firings overlapped balloon ascents and agreed with them. The maximum was about 266°K at 48 km. The probable error was 3%. *Subject Headings:* **1. Upper air temperature data 2. Rocket-grenade experiments 3. White Sands, N. Mex. I. Weisner, A. G.**—*C.E.P.B.*

SOIL TEMPERATURE

See also: **Nocturnal heat exchange of frozen glacier surface** (Ambach), 7.8–13.

7.8–166 551.525:551.311.17

Wegener, Kurt (*Inst. für Meteorologie und Geophysik der Univ., Graz, Austria*), **Die Temperatur in grönlandischen Inlandeis.** [Temperature of the Greenland Icecap.] *Geofisica Pura e Applicata,* Milan, 32:102–106, Sept./Dec. **1955.** 3 figs., 2 refs. English summary p. 102. **DWB, DLC**—The measurements of temperature in holes 1930/1931 and the (corrected) measurements of the temperature in drilled holes 1948/1951 are used to construct the distribution of the temperature in the inland ice of Greenland. *Subject Headings:* **1. Inland ice temperatures 2. Greenland Ice Cap 3. Greenland.**—*Author's abstract.*

7.8–167 551.525.5:631.4

Schmid, Josef, **Die Frosthebung.** [Frost heaving.] *Umschau,* 56(6):177–180, March 15, **1956.** 5 figs., 2 refs. **DLC**—Frost acts on level soil by reducing it to fine fragments which are carried away by the wind in spring (March dust), by softening, pushing out of stones and forming frost patterns. Frost heaving was first systematically investigated by road engineers, but apparatus for measuring it in natural soil was used regularly in 1951–52. Some daily measurements in Mainz are plotted with temperature and precipitation data. The effect, which is due to formation of ice layers, is limited to the surface layers and does not penetrate deeply. *Subject Heading:* **1. Frost heaving.**—*C.E.P.B.*

WATER TEMPERATURE

See also: **Periodic sea temp. variations** (Schweigger), 7.8–168.

7.8–168 551.524.3:551.526.6 551.524:551.577

*Schweigger, Erwin, **Ensayo sobre las variaciones periódicas de la temperatura de mar y sus cíclos en el norte del litoral peruano.** [Periodical sea temperature variations and their cycles on the northern Peruvian coast.] *Compañía Administradora del Guano, Lima, Boletín*

Científico, 1(2):5–20, Sept. 1954. 7 figs. (fold.), 11 refs., 5 tables. **DWB**—Using a series o observations made at Puerto Chicama, Peru, since Dec. 1924 (29 years), 4 years of ocean ographic observations (1939–42) off the Coast of Peru (6°–12°S) and other similar observation from 1930–39 at Puerto Chicama, the author attempts to show a relationship between the sc and air temperature, the barometric pressure and the rainfall, and a cyclical variation in th above. He finds a 41-day cycle which is attributed to a natural period or seiche in the Pacifi Years of heavy rainfall (1925–50) are said to occur uniquely in years when the air temperatur (and sea temperature) was above the mean. Effect of Peruvian Current is considered. Larg folded graphs show interrelationships remarkably well. *Subject Headings:* **1. Air-sea tem perature relationships 2. Temperature-precipitation relationship 3. Peru Curren 4. Puerto Chicama, Peru.**—*M.R.*

PRESSURE AND WIND

PRESSURE

See also: **Computation of atmos. pressure** (Doporto), 7.8–54; **Pressure-height predictability** (White), 7.8–95; **Barometer effect on hard cosmic radiation component** (Trefall), 7.8–102; **Pressure anomalies in S. Hemisphere** (Rubin), 7.8–126; **S. Hemisphere weather map analysis** (Vowinckel), 7.8–130; **Geostrophic and local wind** (Hoshino), 7.8–184.

7.8–169 551.543:525.

*Chapman, Sydney and Westfold, K. C., **A comparison of the annual mean solar an lunar atmospheric tides in barometric pressure, as regards their worldwide distribution o amplitude and phase.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):1–23 Feb. 1956. 8 figs., 4 tables, 52 refs., 2 eqs. **DWB**—The mean annual amplitude and phas of the lunar and solar semidiurnal pressure variations are tabulated for 69 stations (57.9°N 41.1°S) with probable errors and ratios. The data are plotted on 7 world maps. The mean amplitudes of the solar wave range from 275 microbars in 50–60°N to 1366 in 0–10°S, of th lunar wave from 11.3 to 83.9 microbars. The lunar tide decreases more rapidly than the sola in northern latitudes. The mean phase of the solar tide is 153° and of the lunar tide 72° the phase difference is greatest along and off the east coast of Asia and least over Britain *Subject Heading:* **1. Atmospheric tides.**—*C.E.P.B.*

7.8–170 551.543 662:539.1

Rodewald, M., **Das Barometer wurde unruhig.** [Restless barometer.] *Wetterlotse* Hamburg, No. 97:31–34, Feb. 1956. **DLC**—On Feb. 10, 1955 in 36°15′S 124°35,E (near Singapore) 2nd Officer L. Schmidt reported a sudden pressure fall of 8 mb between 15 and 16 h G.m.t. without change of weather. There was a sudden rise and fall of pressure at Alaska at 20½ h on Feb. 12. The Singapore fall was at least 10 times too large to be due to the Russian H-bomb explosion in Wrangel Island, and neither the Singapore nor Alaska times quite fit. The cause remains mysterious. *Subject Headings:* **1. Pressure oscillations 2. Atomic explosion effects.**—*C.E.P.B.*

7.8–171 551.543:551.556:551.46

Saxer, L., **Beziehungen zwischen quasiperiodischen Luftdruckschwankungen und meteorologischen Erscheinungen.** [Relation between quasi-periodic air pressure variations and meteorological phenomena.] *Helvetica Physica Acta*, Basel, 25(5):478–479, Sept. 15 1952. 2 figs. **DLC**—Continuous recordings carried out in the winter of 1948/1949 in Aarau failed to show any connection between air pressure variations and the weather. However a clear relationship between low pressure activity in the Atlantic and measured air pressure variations (in the sense that strong low pressure activity proceeds parallels with air pressure variations) was observed there. In order to obtain a quantitative comparison, the autho used the height of sea waves and the wind speed as a measure of low pressure activity. These values, taken from 4 times daily reports in the **Daily Weather Reports**, London, were com pared with mean air pressure variations measured in Aarau from Nov. 1951 to Jan. 31, 1952

The agreement between these curves was improved by the fact that air pressure variations of the respective day were recorded and compared with wave height and wind speed values of the preceeding day (this should not be used for computing the propagation speed, as the distance between the ships and Aarau changed greatly). The relationship between the intensity of air pressure variations and the height of waves calculated from Fig. 1 shows the correlation coefficient $\mu=0.69$ and the relationship between air pressure variations and wind speed calculated from Fig. 2, $\mu=0.68$. This shows that a low pressure area was the cause of the air pressure variations. *Subject Headings:* **1. Quasiperiodic pressure variations 2. Wave heights 3. Wind speed 4. Aarau, Switzerland.**—*A.M.P.*

7.8–172 551.543:551.583

Schove, D. Justin, **South steering of pressure fluctuations A.D. 1850–1950.** *International Union of Geodesy and Geophysics. Association of Meteorology, Brussels, 1951, Procès-Verbaux des Séances, Mémoires et Discussion*, p. 187. pub. **1953. DWB**—Explains climatic fluctuations by the southerly movement of belts of positive or negative pressure anomalies from the Arctic Circle to the Tropic of Cancer. Years with pronounced extremes are discussed. *Subject Headings:* **1. Climatic variations 2. Pressure anomalies 3. Europe.**—*A.A.*

GUSTINESS AND TURBULENCE

See also: **Plane "snaking" due to turbulence,** 7.8–43; **Vertical wind variations with variable coeff. of turbulent exchange** (Baroff, Samardzhiev), 7.8–117; **Diurnal temp. wave for bounded eddy conductivity** (Staley), 7.8–155; **Stellar shadow band structure** (Protheroe), 7.8–256; **Electronic density fluctuations in turbulent ionized layers** (Gallet), 7.8–262.

7.8–173 551.551:551.510.535:550.38

Dungey, J. W., **The influence of the geomagnetic field on turbulence in the ionosphere.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):39–42, Feb. **1956.** fig., 4 refs., 6 eqs. **DWB**—Eddy motion in the ionosphere would be damped by the action of the geomagnetic field on heavy charged particles, but it is calculated that this action would be inappreciable for eddy sizes <100 km. "In the higher regions the electrons are constrained to move nearly parallel to the magnetic field, and this results in variations of electron density, even when the density of neutral molecules does not vary. These variations are probably appreciable above 100 km." *Subject Headings:* **1. Turbulence in the ionosphere 2. Geomagnetic effects.**—*From author's abstract.*

7.8–174 551.551

Howcroft, James G. and Smith, James R., **A selective analysis of the scale of atmospheric turbulence.** *Journal of Meteorology*, 13(1):75–81, Feb. **1956.** 3 figs., 4 tables, 15 refs., eqs. **DWB**—Data from 4 heated-thermocouple anemometers spaced either parallel or normal to the mean wind were analyzed for frequencies of $\frac{1}{2}$–$\frac{1}{4}$, $\frac{1}{4}$–$\frac{1}{8}$ and $\frac{1}{8}$–$\frac{1}{16}$ cycles/sec. and scale or mean eddy size for each band estimated. "At the highest frequencies, there is approximate equality between the transverse and longitudinal scales and the variation with time of day appears small. At the lower frequencies the nighttime data show slight increases in the scale for both orientations; during the day considerable increase in the longitudinal scale is noted with decreasing frequency whereas the transverse scale shows a proportionally smaller increase. The limited data available suggest that the scale is proportional to a power of the mean wind speed from 0.5 to 1.0." *Subject Heading:* **1. Turbulence research.**—*C.E.P.B.*

7.8–175 551.551:629.13

Taylor, J. (*Royal Aircraft Establishment*), **Gusts and their measurement.** *Royal Aeronautical Society, London, Journal*, 58(528):826–832, Dec. **1954.** 20 figs. (incl. photos). **DWB**—Discussion of gusts or vertical velocities as affecting aircraft in flight, formulas for calculating gust accelerations and wing loadings due to gusts, acceleration due to vibration, accelerometers used for measuring accelerations due to gusts and, finally, use of counting accelerometers in Comets flying over 300,000 mi on South African and other air routes and spectrum of gusts at different altitudes based on >200,000 miles (1500, 5200, 12,400 and 35,000 ft.) as well as

with different speeds. *Subject Headings:* **1. Gustiness measurement 2. Accelerometer 3. Aeronautical meteorology.**—*M.R.*

7.8–176 551.551:551.584.41:632.9:63

Thompson, B. W., **Aircraft applications of insecticides in East Africa, Pt. 3, Atmospheric turbulence in woodland.** *Bulletin of Entomological Research*, London, 44(4):611–626, Dec. **1953.** 7 figs., 2 tables, 8 refs. **DLC**—To determine suitable times for applying insecticide wind and temperature were measured in woodland from $2\frac{1}{2}$ m above ground to 5 m above canopy, daily at $\frac{1}{2}$ hour intervals from 7 to $18\frac{1}{2}$ h. Observations at 10 and $2\frac{1}{2}$ m on an airfield were used for comparison. The diurnal variations of velocity and temperature gradient 10–$2\frac{1}{2}$ m are plotted in woodland and open. Examples of temperature profiles in woodland are given. Some observations were made of a bidirectional vane at 10 m and of smoke clouds. It was found that in nonturbulent conditions slow upward and downward sheet movements of air occur by day and night, but increased wind during day introduces turbulence, which is greater the lower the trees. By day there is a marked flow of air towards clearings. *Subject Headings:* **1. Turbulence in woodland 2. East Africa.**—*C.E.P.B.*

HORIZONTAL DISTRIBUTION AND WIND VARIATIONS

See also: **Graphic presentation of wind data** (Pinna), 7.8–53; **Analysis of met. situation during gale** (Gregor), 7.8–91; **Squall fronts, Red Sea and Mediterranean** (Rodewald), 7.8–148; **Statistical analysis of radar winds** (Hofmeyz), 7.8–183.

7.8–177 551.553.1

Yamashita, I., **Lake wind on the Lake Suwa.** *Journal of Meteorological Research*, Tokyo 5(8):701–702, Sept. **1953.** 5 figs. In Japanese; English summary p. 701. **DWB**—Lake Suwa is 14 sq km in area; the southern coast having a steep slope, the northern a gentle slope, the eastern a broad open field, and the River Tenryu flowing out from the western side. The features of wind round the lake from morning till evening are as follows: A) There exists the same phenomenon as land and sea breeze in the morning and evening, especially on the gentle slope of the northern coast. B) The wind blowing up the River Tenryu sometimes becomes strong. *Subject Headings:* **1. Lake breezes 2. Lake Suwa, Japan.**—*Author's abstract.*

VERTICAL DISTRIBUTION AND SPECIAL WINDS

See: **Vertical wind variations with variable coeff. of turbulent exchange** (Baroff, Samardziev), 7.8–117; **Geostrophic and local wind** (Moshino), 7.8–184.

WIND EFFECTS

See also: **Quasi-periodic pressure variations and met. phenomena** (Saxer), 7.8–171.

7.8–178 551.556:551.465

Bowden, K. F., **The flow of water through the Straits of Dover related to wind and differences in sea level.** *Royal Society of London, Philosophical Transactions, Ser. A*, 248(953) 517–551, Feb. 9, **1956.** 18 figs., 8 tables, 27 refs., 23 eqs. **DWB**—Continuous records of potential difference Feb. 1953–June 1954 in a cable between St. Margaret's Bay and Sangatte (34 km), calibrated by known tidal currents, gave a p.d. of 1 V∼current of about 2.75 kn, depending on conductivity of sea water, which has an annual variation. Observations were also available for a cable Aldeburgh-Domburg. Earth currents associated with magnetic disturbances were eliminated and the residual current averaged over 25 h. The results agreed with vertical log measurements at Varne light vessel. Compared with wind component to NE at Lympne (340 ft) and sea level gradient, the mean current V cm/s is given by $0.37W^2\cos\phi+0.70\Delta\zeta$, where $W\cos\phi$ is wind in cm/s normal to the section and $\Delta\zeta$ the difference in sea level in cm through the Straits. Peaks of current stress were up to 6 hrs after peaks in wind or sea gradient. Coefficients of 4.5×10^{-3} for wind stress and 3.8×10^{-3} for bottom friction are deduced. Other relations are less close. The results for selected periods are discussed. *Subject Headings:* **1. Wind currents 2. Straits of Dover.**—*C.E.P.B.*

7.8–179 551.556:551.465

Shtokman, V. B., **Opredelenie skorosteĭ techeniia i raspredeleniia plotnosti v poperechnom echenii beskonechnogo kanala v zavisimosti ot effekta vetra i bokovogo treniia v pole sily oriolisa.** [Determination of the speeds of the current and of the distribution of density in he cross-section of an infinite channel as a function of the effect of wind and lateral friction n the field of Coriolis force.] *Akademiia Nauk SSSR, Doklady*, 71(1):41–44, March **1950.** figs., 2 refs., 17 eqs. **DLC**—Extension of theoretical work of the author (1948 and 1949) n the relation of currents in baroclinic sea to mass and wind, to take into account the effects f lateral friction in the Coriolis parameter. *Subject Headings:* **1. Wind driven currents . Side friction effects in sea 3. Coriolis force.**—*M.R.*

7.8–180 551.556:551.461(264)

Shtokman, V. B., **Znachenie vetra i rel'efa dna v obrazovanii nabliudaemykh osobenosteĭ dinamicheskoĭ topografii iuzhnoĭ chasti Atlanticheskogo okeana.** [Significance of ind and bottom relief in the formation of the dynamic characteristics of the southern part f Atlantic Ocean.] *Akademiia Nauk SSSR, Doklady*, 60(6):985–988, May **1948.** 3 figs., refs., 5 eqs. **DLC**—Features clearly expressed by the undulating contours of dynamic surces crossing the ocean from W to E between latitudes 25–40°S and by closed ring-shaped egions of dynamic heights, resembling a series of vortexes inside the wavelike belt, are shown n a topographic chart of the South Atlantic surface according to A. DEFANT's numerous bservations (on the "Meteor"). As indicated by DEFANT, this chart of dynamic topography f the ocean's surface is astonishingly similar to, and is linked with, the underwater relief of he region which is characterized by alternating elevations and depressions of the ocean's ottom as shown by a chart representing the bathometry of the region. The observed regularities are explained in the light of the author's earlier theory of stationary currents stirred up y winds in a heterogeneous sea. *Subject Headings:* **1. Wind effects 2. Sea surface contours . South Atlantic.**—*A.M.P.*

UPPER AIR WINDS

See also: **Upper wind, Honjo, Tateno,** 7.8–55; **Atmos.-electrical problems of stratosphere res.** (Dieckmann), 7.8–56; **Stellar shadow band structure** (Protheroe), 7.8–256; **Upper atmos. wind and sonic velocity** (Groves), 7.8–280.

7.8–181 551.557:551.510.535:551.501.8

Chappell, D. W. G. and Henderson, C. L., **The determination of the horizontal velocity f ionospheric movements from fading records from spaced receivers.** *Journal of Atmospheric nd Terrestrial Physics*, London, 8(3):163–168, March **1956.** fig., 3 refs., 17 eqs. **DWB**—ATCLIFFE has shown that, for the Mitra formula for the velocity of ionospheric movements o be valid, a long sample of fading record is necessary. This paper presents a method of eriving the velocity which is not dependent on a long sample of record, and is valid for any rbitrary distribution of orientation of "lines of maximum amplitude." The derived formula s compared with Mitra's formula, and the time delays from a fading record are analyzed. The ethod is not suitable for use with Philips records. *Subject Heading:* **1. Ionospheric wind easurement.**—*Authors' abstract.*

7.8–182 551.557:551.510.535

Court, G. W. G. and Gilfillan, E. S., **A determination of ionospheric winds for a 24-hour eriod.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(3):169–170, March **1956.** figs., 2 refs. **DWB**—Records from 3 spaced aerials at Lower Hutt, New Zealand, for 24 hrs n Jan. 17, 1953 were analyzed. E layer wind varied irregularly from S at 0h local time through V and N to SE at 12–14h(0h G.m.t.) and back again. Mean velocity was about 80 m/s. *ubject Heading:* **1. Ionospheric winds.**—*C.E.P.B.*

7.8–183 551.557:551.552(68)

*Hofmeyr, W. L., **A statistical analysis of radar winds over Maun in summer.** *South frica. Weather Bureau, Notes*, 3(3):192–195, **1954.** 5 tables, 5 refs. **DWB**—Data on the pper winds for Maun (lat. 19°59′S, long. 23°25′E) were obtained by means of a radar set.

The results presented in this study are based upon observations made from Oct. 1953–Marc 1954. Three wind regimes occur over Maun; they consist of a lower and upper easter flow and a middle westerly flow; each characterized by its own velocity and variability. "T two zones of transition between these are a little above 500 mb and slightly below 100 m levels." These winds are explained in terms of the general circulation pattern over Southe Africa. *Subject Headings:* **1. Wind regime 2. Upper air wind data 3. Statistical analys 4. Maun, Bechuanaland.**—*I.L.D.*

7.8–184 551.557:551.542.1:551.5

Hoshino, Tsuneo, **Comparison between geostrophic wind and local wind in Niiga Prefecture.** *Journal of Meteorological Research*, Tokyo, 7(2):109–111, March **1955.** 6 fig In Japanese. **DWB**—Statistical study and graphic analysis of data. *Subject Heading* **1. Geostrophic winds 2. Local winds 3. Niigata, Japan.**—*M.R.*

7.8–185 551.557:551.507.3

Weisner, Allan G., **Measurement of winds at elevations of 30 to 80 kilometers by t rocket-grenade experiment.** *Journal of Meteorology*, 13(1):30–39, Feb. **1956.** 7 figs., tabl 32 refs., 27 eqs. **DWB**—The rocket-grenade explosions at White Sands (*see* 7.8–165) al enable the upper winds to be determined from the sound waves. The method of analysis set out. The 6 ascents gave westerly winds in Oct.–Dec. and easterly in June–July. T maximum velocity (up to 104 m/s in Dec. and 89 in July) was at about 55 km. Above 55 k there was some tendency towards southerly winds. *Subject Headings:* **1. Upper air win measurements 2. Rocket explosions 3. White Sands, N. Mex.**—*C.E.P.B.*

VERTICAL MOTION

7.8–186 551.558.1:551.515.7

Raab, Lars (*Met. and Hydrol. Inst., Stockholm*), **A weather situation with strong convectio in the middle stratosphere.** *Tellus*, Stockholm, 7(3):322–328, Aug. **1955.** 11 figs., tabl 3 refs., eqs. **DLC**—Two examples of convective cells in the middle stratosphere are demon strated. They have been measured during two routine aerological soundings in Östersun central Sweden. The accuracy of the measurements of the vertical wind velocities (in on case amounting to some 10 m/sec) is discussed. The phenomenon is explained from th weather situation, which is characterized by two cold pools, one in the troposphere movin southwest from Russia and one in the upper stratosphere moving southsoutheast over Scan dinavia from the North Pole region. *Subject Headings:* **1. Cold lows 2. Convective current** —*Author's abstract.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

HUMIDITY

See: **Wet-bulb temp., Aberdeen and Eskdalemuir** (Thomson), 7.8–13; **Physics and textiles** (Cassie), 7.8–46; **Balance requirements of general circulation** (Starr), 7.8–129.

EVAPORATION AND EVAPOTRANSPIRATION

See also: **Measurem. with Piché evaporimeter** (Germany. Deutscher Wetterdienst), 7.8–74; **Snow accumulation and ablation** (Ward), 7.8–212; **Climate and sci. irrigation, New Jersey** (Thornthwaite), 7.8–247; **Physical effects of dormant oil sprays** (de Villiers), 7.8–249.

7.8–187 551.573(42

Howe, G. Melvyn, **The moisture balance in England and Wales based on the concep of potential evapo-transpiration.** *Weather*, London, 11(3):74–82, March **1956.** 6 figs table, 16 refs. Also: Rigg, J. B., **Moisture balance.** *Ibid.*, 11(7):238, July **1956.** DWB-

Values of potential evapotranspiration, calculated by THORNTHWAITE's formula, and of precipitation are plotted monthly for 6 stations. Maps are drawn of average p.e-t. (year and April–Sept.) over England and Wales, seasonal water surplus and water deficiency, and moisture regions based on the "moisture index" (ranging from perhumid to dry sub-humid). By comparison with actual runoff it is found that THORNTHWAITE's formula gives too high p.e-t. in England. RIGG presents a critical discussion of HOWE's article. *Subject Headings:* **1. Potential evapotranspiration 2. England.**—*C.E.P.B.*

7.8–188 551.573:631.67

Thornthwaite, C. W. and Mather, J. R. (*Lab. of Climatology, Route 1, Centerton, Elmer, N. J.*), **Climatology and irrigation scheduling.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 42(26):6–8, June 27, **1955.** 3 figs., table. **DWB**—After defining potential evapotranspiration and explaining the method of its measurement, the author points out the importance of its knowledge in irrigation work, as it provides information concerning the water needed by plants and thus the amount to be supplied by irrigation to supplement rainfall in case of soil-moisture deficiency. Limits can be set below which the soil moisture should not be allowed to fall for the particular crop and depth of root zone in question. By keeping a daily record of the evapotranspiration it is possible to know when the soil moisture depletion is reached, and to know how much and when to irrigate to bring the moisture level back to a safe value. A table showing the irrigation need during the past 7 years (1948–1954) in the area near Memphis, Tenn., on basis of a program of 1.5 in. of irrigation every time the moisture deficit reached 2.0 in., a map of U. S. showing the average annual potential evapotranspiration and 2 graphs, one showing the daily variation in soil-moisture deficit for 1954 and the second showing the average water balance for the same area, are included. *Subject Headings:* **1. Potential evapotranspiration charts 2. Irrigation 3. United States.**—*A.M.P.*

7.8–189 625:631.4 551.573:551.579.5

Thornthwaite, C. W., **Summary and future work [on estimating soil tractionability].** *Johns Hopkins Univ. Laboratory of Climatology, Publications in Climatology*, 7(3):407–409, **1954.** ref. **DWB**—Brief outline of work done under soil tractionability contract (soil moisture analysis, evapotranspiration, topographic effects, precipitation intensity). Geographic mapping of hydroclimatological elements is suggested. *Subject Headings:* **1. Soil trafficability 2. Evapotranspiration.**—*A.A.*

7.8–190 551.573:551.481.1

Volker, A. (*Engr., Zuiderzee Works*), **Evaporation du Lac Ijssel.** [Evaporation of Lake Ijssel.] *International Union of Geodesy and Geophysics. International Association of Scientific Hydrology, Brussels, 1951,* [*Transactions*], 3:406–408, **1952. DWB**—The evaporation formula $E=c(1+0.25v)\ (e_w-e_d)$ (usual symbols) was tested on observations from a pan and then applied to the whole of Lake Ijssel, taking into account the temperature differences between pan and lake. Evaporation ranges from 9 mm in Jan. to 109 mm in July, annual amount 652 mm. The computation is tested by the water balance method. *Subject Headings:* **1. Evaporation from lakes 2. Lake Ijssel, Netherlands.**—*A.A.*

CONDENSATION

7.8–191 551.574.1:551.46

Twomey, S. and McMaster, K. N. (*both, Div. of Radiophysics, C.S.I.R.O., Sydney*), **Production of condensation nuclei by crystallizing salt particles.** *Tellus*, Stockholm, 7(4):458–461, Nov. **1955.** 2 figs., table, 6 refs. **DWB, DLC**—Experiments were conducted to examine the possibility of condensation nuclei being produced by salt droplets when the environmental humidity was lowered sufficiently for crystallization to take place. It was found that condensation nuclei were in fact produced when salt particles crystallized, each salt particle producing at least several hundred nuclei. It is suggested that these nuclei consisted of minute salt crystals, with mass in the range 10^{-18} to 10^{-14}g, released from the main mass of salt during crystallization. *Subject Heading:* **1. Saline nuclei from salt spray.**—*Authors' abstract.*

7.8–192 551.574.1:544.

Vittori Antisari, Ottavio (*Mt. Cimone Obs.*), **La rivelazione di particelle costituite d particolari sostanze chimiche nell'indagine sui nuclei di condensazione e sui nuclei di subl mazione artificiali.** [Identification of particles of a particular chemical substance in inves gating condensation nuclei and artificial sublimation nuclei.] *Rivista di Meteorologia Aer nautica*, Rome, 14(2):17–22, April/June **1954.** 7 figs., 4 refs., eq. French, English a German summaries p. 17. **DLC**—Describes a method in which the Liesegang reaction applied to the detection of small particles of specific chemical substances, particularly natural and artificial condensation nuclei. The method involves capturing the particles various gels where they become, by chemical reaction, visible under a microscope. *Subj Heading:* **1. Nuclei analysis.**—*G.T.*

7.8–193 551.574.1:551.578.

Woodcock, A. H. and Blanchard, D. C. (*both, Woods Hole Oceanog. Inst.*), **Tests of th salt-nuclei hypothesis of rain formation.** *Tellus*, Stockholm, 7(4):437–448, Nov. 195 5 figs., 7 tables, 12 refs., eqs. **DWB, DLC**—Atmospheric chlorides in sea salt nuclei and th chlorides dissolved in shower rainwaters were recently measured in Hawaii. A comparis of these measurements reveals the remarkable fact that the weight of chloride present in certain number of nuclei in a cubic meter of clear air tends to be equal to the weight of chlori dissolved in an equal number of raindrops in a cubic meter of rainy air. This result is explain as an indication that the raindrops grow on the salt nuclei in some manner which prevents marked change in the distribution of these nuclei during the drop-growth process. Th data presented add new evidence in further support of the salt nuclei raindrop hypothes previously proposed by the first author (Woodcock, 1952). *Subject Headings:* **1. Saline nucl 2. Rain composition 3. Hawaii.**—*Authors' abstract.*

7.8–194 551.574.4

Sarson, P. B., **Rime at Holme Moss.** *Meteorological Magazine*, London, 85(1004):57–58 Feb. **1956.** 4 photos. **DWB**—Four remarkable photos are reproduced showing rime form on the television transmitter near Huddersfield on March 17, 1954. It formed in an inversio in an E wind in Pc air. There was no effect on transmission. *Subject Heading:* **1. Rime** —*C.E.P.B.*

FOG

See also: **Smogs,** 7.8–99; **London fogs** (Waller, Lawther), 7.8–101.

7.8–195 551.575:656.61:313.

Rodewald, M., **Der Untergang der "Victoria City"—Schuld einer Nebelfahne?** [Th wreck of the "Victoria City"—result of a fog bank?] *Wetterlotse*, Hamburg, No. 96:16–17 Jan. **1956.** fig. **DLC**—On Dec. 14, 1955, the "Victoria City" collided with an Italian shi NE of Terschelling and sank. The collision was probably due to a fog bank, which is charted *Subject Headings:* **1. Fog effects 2. Shipwrecks.**—*C.E.P.B.*

7.8–196 551.575.1(265.3

§*Arakiseki, T., **On the sea fog over the Okhotsk Sea.** *Journal of Meteorological Research* Tokyo, 7(2):71–76, March **1955.** 6 figs., table, 6 refs., eqs. In Japanese; English summary p. 71. **DWB** —Some observational results of sea fog on the coast of Okhotsk Sea in the summe seasons of 1951 and 1952 are examined. Main results are as follows: (1) Synoptic situation which result in the occurrence of sea fog generally fall into three different types, each of which has a characteristic distribution of surface pressure. (2) The liquid content of fog was ob served. *Subject Headings:* **1. Sea fog 2. Water content of fog 3. Okhotsk Sea.**—*Author's abstract.*

CLOUDS

7.8–197 551.576:778.3

Koschmieder, H., **Photographie und Photogrammetrie im Dienste der Wolkenforschung** [Photography and photogrammetry in the service of cloud investigation.] *Umschau*, Frank

furt, a.M., 56(8):225–227, April 15, 1956. 6 figs., 9 refs. **DLC**—Development of cloud photography, cinematography and stereophotography is described, with author's technique for cloud history. Development of a cumulus cloud is sketched at 60 sec intervals over 17 min. Photogrammetry can measure cloud heights of 4000 m to ±5 m and slopes to 10%; contours of cirrus and altocumulus are shown. Color photographs and a blue-red stereoscope viewer are included. *Subject Heading:* **1. Cloud photography.**—*C.E.P.B.*

7.8–198 551.576.11

Warner, J. (*Radiophysics Lab., C.S.I.R.O., Sydney*), **Water content of cumuliform cloud.** *Tellus*, Stockholm, 7(4):449–457, Nov. **1955.** 10 figs., 14 refs. **DWB, DLC**—Measurements have been made of liquid water content throughout many cumuliform clouds. The amount of water present at any level was always less than the adiabatic value, and the ratio of these two quantities decreased with height above cloud base. This ratio was found to be independent of the horizontal extent of the cloud except in the case of very small clouds. The transition between clear air and dense cloud was frequently abrupt. *Subject Headings:* **1. Water content of clouds 2. Cumulus cloud structure.**—*Author's abstract.*

PRECIPITATION

See also: **Dry and wet spell frequency, Tel Aviv** (Neumann), 7.8–11; **Density change of coastal water** (Ichiye), 7.8–31; **Raindrop damage,** 7.8–42; **Reduction of rainfall series** (Schneider-Carius), 7.8–51; **Periodic sea temp. variations** (Schweigger), 7.8–168; **Effect of rainfall and soil management on soil and water losses** (Bartholomew, others), 7.8–214.

7.8–199 551.577.21(71)

*Longley, Richmond W. (*Suffield Exp. Station, Ralston, Alberta*), **Variability of annual precipitation in Canada.** *Monthly Weather Review*, Wash., D. C., 81(5):131–134, May **1953.** fig., table, 2 refs. **DWB**—Annual precipitation data for 142 Canadian and 34 U. S. stations with at least 30 years of record were used in order to draw a map of the coefficient of variation (standard deviation divided by the mean) for Canada. The variability, presented on a map, increases toward the pole. Data are given for each station. *Subject Headings:* **1. Precipitation variability 2. Climatic charts 3. Canada.**—*A.A.*

7.8–200 551.577.22(521.52)

*Masatsuka, Akira and Kusama, Sozo, **Some statistical studies on the precipitation at Matsumoto, Nagano Prefecture.** *Journal of Meteorological Research*, Tokyo, 6(12):599–608, Jan. **1955.** 4 figs., 10 tables, 4 refs. In Japanese; English summary p. 599. **DWB**—The authors made monthly cumulative frequency tables of the amount and the duration of precipitation and tables showing some characteristics of rainfall intensity, and the amount of rainfall observed at Matsumoto weather station. Completely statistical study. *Subject Headings:* **1. Rainfall data 2. Rainfall frequencies 3. Rainfall intensities 4. Matsumoto, Japan.**—*H. Arakawa.*

7.8–201 551.577.22(433)

Schirmer, H., **Über die Niederschlagshäufigkeit in Bamberg.** [On rainfall frequency in Bamberg.] *Meteorologische Rundschau*, Berlin, 8(11/12):199–201, Nov./Dec. **1955.** fig., 4 refs. **DLC**—The differences of annual numbers of days with at least 0.1 mm at Bamberg and Würzburg are tabulated yearly 1881–1954. Jumps are due to changes of site and raingage at Bamberg. New monthly normals for 2 stations in Bamberg are given. *Subject Headings:* **1. Rain days 2. Bamberg, Bavaria.**—*C.E.P.B.*

7.8–202 551.577.3

Thom, Herbert C. S. (*U.S.W.B., Wash., D. C.*), **Statistical analysis of long term fluctuations in Pennsylvania precipitation.** (In: Pennsylvania Electric Association. Hydraulic Power Committee, Symposium on climatic trends in Northeastern United States, April 22–23, 1952, **Minutes. 1952.** p. 55–66. **Discussion,** p. 67–71. 15 figs., 3 refs., 5 tables, eqs.)

DWB—It is shown by several examples of statistical tests applied to series of precipitatio records from Weather Bureau stations in Pennsylvania that the random fluctuations in weathe are so much greater than the cyclical or periodic variations, that the latter are of no significanc even if they are predictable. Methods of statistical analysis are discussed. It is shown tha the series are close enough to random so that normal frequency distribution and other standar parameters can be used with confidence for all practical purposes. Moving averages ar shown to introduce non-random fluctuations. *Subject Headings:* **1. Statistical analysi 2. Precipitation variations 3. Pennsylvania.**—*M.R.*

7.8–203 **551.577.34**(410

McClean, W. N., **January rainfall.** *Weather*, 11(1):17, Jan. **1956.** fig. **DWB**—Plot o accumulated Jan. rainfall of British Isles, 1875–1950 as an excess over 3.0 inches per mont shows that average changed abruptly in 1916 from 3.0 to 3.8 inches. Rainfall for year als changes. 1881–1915 is not a representative period. *Subject Headings:* **1. Rainfall trend 2. British Isles.**—*C.E.P.B.*

7.8–204 **551.577.34**(82

Schwerdtfeger, Werner and Vasino, Cesar J., **La variación secular de las precipitacione en el este y centro de la República Argentina.** [Secular variation of precipitation in Eas and Central Argentina.] *Meteoros*, Buenos Aires, 4(3):174–193, July/Sept. **1954.** 10 figs. 7 tables, 7 refs., eq. Spanish and English summaries p. 174. **DWB**—A statistical analysi of the 1900-1950 precipitation in eastern Argentina in order to determine whether the observe gradual increase is real or the result of chance and the possible causes of this phenomenon. I is shown that in the region of the greatest increase in the southern part of the south Santa F and Entre Rios provinces and in the extreme north of Buenos Aires the average change amount to 5.5 mm a year with a probability of 99.9% that the increase in precipitation is not due t chance. The possible causes of the change in precipitation may be sought in the variation of the general circulation over the extratropical zones of South America indicated by th diminution of the pressure gradient Buenos Aires-Puenta Arenas and the modification of th original vegetation of Argentina by the extension of agriculture. The secular changes in th distribution of precipitation is shown on charts. *Subject Headings:* **1. Precipitation variations 2. Argentina.**—*I.L.D.*

7.8–205 **551.577.38**:001.4

Alpat'ev, A. M., **O pokazatele zasukhi.** [Drought index.] *Meteorologiia i Gidrologiia* Leningrad, No. 4:21–24, July/Aug. **1955.** table. **DWB**—The hydrothermal drought inde of Selianinov is criticized for its lack of precision and the use of crop yield as an index o drought is found to be not specific. The author states that the hydrothermal index for th spring-summer period is adequate for characterizing drought for spring grain sowing. The use of climatological data for characterizing drought is discussed. Definition of drought conditions are examined from point of view of crop yield, and soil moisture content is discussed. *Subject Headings:* **1. Drought indexes 2. Crop yield.**—*I.L.D.*

7.8–206 **551.577.38**(09)(422):634.94

Schove, D. Justin, **Droughts of the dark ages and tree-rings, A.D. 714–835.** *Weather*, London, 10(11):368-371, 395, Nov. **1955.** 2 tables, 9 refs. **DWB**—Rings from 11 oak timbers from a Saxon site at Hamwih near Southampton, dated 835 A.D., show very severe droughts in 719, 737, 764 and 783 (provisional dates). *Subject Headings:* **1. Historic droughts 2. Tree ring data 3. Southampton, Eng.**—*C.E.P.B.*

7.8–207 **551.577.38**(411)

Watson, R. A., **The dry summer of 1955 in East Scotland.** *Weather*, London, 11(3):97, March **1956. DWB**—During 12 months ending Nov. 1955, 16.64″ rain fell in Edinburgh, the least since 1826. Sunshine (1691 hrs) greatly exceeded any other year since records began in 1891. The year was "outstanding" in the sense that it only occurs once in a lifetime. *Subject Headings:* **1. Drought, Scotland (1955) 2. Scotland.**—*C.E.P.B.*

7.8–208 551.577.5:551.515.8

Rein, František (*Prague Univ. Met. and Clim. Inst.*), **Srážky v Čechách pri některých synoptických situacích v letním pololetí (Poznámky k přibývání srážek z rostoucí nadmořskou výškou, III).** [Precipitation in Bohemia in connection with certain synoptic situations in the summer season, Pt. 3 of Notes on the increase of precipitation with height above sea level.] *Meteorologické Zprávy*, Prague, 8(1):14–16, Feb. 28, **1955.** 4 figs. Russian and German summaries p. 14–15. **DWB**—This is a continuation of a study of orographic effects on rainfall distribution in Bohemia. Precipitation distribution is analyzed for selected types of synoptic situations, considering direction and speed of frontal passages. With fast passages of fronts the precipitation pattern reflects the position of the station with respect to windward or leeward slopes. With slow or quasi-stationary fronts no precipitation increase with altitude and no orographic effect is found. *Subject Headings:* **1. Rainfall distribution 2. Orographic effects 3. Frontal passage effects 4. Bohemia, Czechoslovakia.**—*Trans. of author's abstract.*

RAIN AND SNOW

See also: **Physical geology** (Leet, Judson), 7.8–7; **Electric charges when blowing snow** (Norinder, Siksna), 7.8–12; **Salt-nuclei hypothesis of rain formation** (Woodcock, Blanchard), 7.8–193; **Snow cover and local climate** (Miller), 7.8–224.

7.8–209 551.578:061.6

Gold, Lorne W., **New snow and ice research laboratory in Canada.** *Journal of Glaciology*, London, 2(19):635–637, March **1956.** fig., 2 photos. **DWB**—Two controlled low temperature rooms (+40 to −50°F) were put into operation in July 1954 by the Division of Building Research, National Research Council, Canada. Their construction and equipment are described. Work has begun on measuring the strengths of ice in tension and compression and the influence of temperature and rate of loading. *Subject Headings:* **1. Snow and ice research. I. National Research Council, Canada.**—*C.E.P.B.*

7.8–210 551.578.4(712)

*Currie, B. W., **Snowfall.** *Saskatchewan. Univ. Physics Dept., Prairie Provinces and Northwest Territories: Climatic Studies*, Pt. 3, Nov. **1953.** 28 p. 6 figs., 6 tables, 4 refs. **DWB**—This section of the series of Climatic Studies of the Prairie Provinces gives descriptive and tabular information on average, extreme, frequencies and characteristics of snow and snow cover in Alberta, Saskatchewan, Manitoba and the N.W. Territories. The most valuable additions to the normal climatological treatment of snowfall data are the tables (and text) on the expectancy of various annual amounts of snow, of various monthly amounts, aggregate snowfalls and expectancies of various ranges thereof, daily snowfall expectancies, hours with snowfall (see section on precipitation) and discussion of blizzards, snow drifting, dynamics of drifting snow, physical characteristics of snow cover, snow clearance, snow and agriculture, industry, etc. *Subject Headings:* **1. Snow cover 2. Snow frequency data 3. Prairie Provinces, Canada.**—*M.R.*

7.8–211 551.578.46

§Shidei, T., **Some observations on one special type of new snow avalanche which occurred in Yamagata and Fukushima Prefecture in 1952.** *Seppyo* (*Snow and Ice*), Tokyo, 14(4):116–119, March **1953.** 5 figs. In Japanese. **DWB**—Illustrations include synoptic chart for Feb. 26, 1952 (deep low over southern Japan); graphs of several meteorological factors recorded at Kamabuchi (pressure, temperature, humidity and snow depth) for each hour from 22h Feb. 24th to 20h on Feb. 26; topographical chart showing where avalanches occurred and depth of new snow, and a schematic diagram showing course of avalanche in a small enclosed valley such as Ramabuchi in Yamagata. *Subject Headings:* **1. Avalanche meteorology 2. Japan.**—*M.R.*

7.8–212 551.578.46:551.573:08

Ward, W. H., **Snow accumulation and ablation.** *Nature*, London, 177(4508):563–564, March 24, **1956.** 11 refs. **DWB**—Account of a joint discussion by the Royal Meteorological

Society and British Glaciological Society on Jan. 18, 1956. Previous investigations of the heat balance of glaciers are described and some contributions to the discussion summarized. *Subject Headings:* **1. Snow accumulation 2. Ablation 3. Symposia.**—*C.E.P.B.*

7.8–213 551.578.4

Yoshida, S., **On the relation between observed snow depth and the ground area released from snow cover.** *Journal of Meteorological Research*, Tokyo, 5(6):555–556, July 195[illegible] 2 figs., eq. In Japanese; English summary p. 555. **DWB**—An empirical relation was found between snow depth and the percentage of snow-free area. A graph representing this relation and a model of snow cover surface in early spring are presented. *Subject Headings:* **1. Snow cover 2. Snow depth 3. Japan.**—*G.T.*

HYDROMETEOROLOGY

See also: **Future work in estimating soil tractionability** (Thornthwaite), 7.8–189.

7.8–214 551.579:551.577:63(767)

*Bartholomew, R. P.; Hinkle, D. A. and Engler, Kyle, **Effect of rainfall characteristics and soil management practices on soil and water losses in Northwest Arkansas.** *Arkansas Experiment Station, Fayetteville, Bulletin*, No. 548, [1954?] 54 p. 4 figs., 10 tables, 5 refs. Append. p. 38–54. entirely tables. **DWB**—The results of experiments to determine the relationship between the precipitation patterns and various practices on soil and water conservation, and the subsequent effect on crop yields are discussed. Precipitation amount and intensity, effect of cropping, plowing, vegetative cover, crop rotation and previous erosion upon water and soil losses, the effect of soil and water losses on yields were studied. Data on amount and intensity of precipitation, and percentage of precipitation lost in runoff from plots under various types of soil management are given in tables. *Subject Headings:* **1. Soil moisture 2. Water conservation 3. Agronomy 4. Arkansas.**—*I.L.D.*

7.8–215 551.579:551.43:061.3

Przedpełska, W., **Konferencja poswięcona zagadnieniom gospodarki wodnej w gôrach.** [Conference on problems of water occurring in mountains.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 8(1):92–94, **1955. DWB**—Minutes of the conference held on Aug. 23–25, 1954, at Żywiec are presented. A lively discussion followed the 7 reports on regulation of mountain rivers and their basins and runoff. It was pointed out that in view of the importance of precipitation, mountains can determine the water supply for the whole country. *Subject Headings:* **1. Mountain hydrology 2. Runoff 3. Hydrologic conferences.**—*A.M.P.*

7.8–216 551.579:551.48(44)

Schachter, D., **Contribution à l'étude hydrographique et hydrologique de l'étang de Berre, Bouches-du-Rhone.** [Contribution to the hydrographic and hydrologic study of Berre Lagoon at the mouth of the Rhône.] *Institut Océanographique, Monaco, Bulletin*, 51(1048), Aug. 31, **1954.** 20 p. 6 diagrs. (fold.), tables, refs. p. 12–13. Price: 160 fr. **DWB**—Data for March 1952 to Feb. 1953 obtained at the Berre Lagoon in the Rhône Delta are analyzed and presented in graphs and tables. Monthly precipitation and evaporation are presented on the same histograms; daily pressure, wind, air, sea and water temperature, precipitation and evaporation on single extended chart. In addition chemical analyses of the water in the lagoon are presented for ecological studies of the fauna. *Subject Headings:* **1. Micrometeorological data 2. Ecological studies 3. Limnology 4. Berre Lagoon, France.**—*M.R.*

7.8–217 551.579(02)

Somov, N. V., **[Review of] Gidrologiia sushi i raschety rechnogo stoka [by] A. I. Chebotarev.** [Review of "Hydrology of the dry land and calculation of river runoff" by A. I. Chebotarev.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:61–63, Jan./Feb. **1955. DWB**—A review of the second edition of a book that was first published in 1950. This textbook designed for hydrometeorological technical schools is regarded as not entirely satisfactory and

its shortcomings are pointed out. The book discusses: water distribution and water cycle in nature, and principal climatic factors of the water cycle, underground waters, lakes, marshes, glaciers, rivers and calculation of river flow. *Subject Headings:* **1. Hydrology 2. Hydrologic cycle 3. River runoff calculations 4. Hydrology textbooks 5. Critical reviews. I. Chebotarev, A. I.**—*I.L.D.*

7.8–218 551.579.4:551.482

Azarkovich, E. Sh. and Margolin, L. M., **Malye reki i ikh norma stoka.** [Small rivers and their flow normals.] *Meteorologiia i Gidrologiia*, Moscow, No. 3:44–46, May/June **1955.** fig., table, refs. **DWB**—The results of a 5–6 year series of observations on the flow normal of small rivers carried out in the basin of the Upper Volga are analyzed. The flow normal k for each point, the mean annual flow in liters/sec km² and the degree of woodiness and marshiness are given in a table and the dependence between the coefficient of diminution of flow normal of small rivers upon woodiness and swampiness is shown in a graph. *Subject Headings:* **1. River flow 2. Volga River.**—*I.L.D.*

7.8–219 551.579.4

Szwed, Feliks, **Analiza przebiegu wezbrań na Wiśle od Skawy do Raby.** [Analysis of high stages on the Vistula between Skawa and Raba.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 6(3/4):12–15, **1953.** pub. 1954. 3 figs., 2 tables. **DLC**—The phenomenon of river level variations during the passage of flood swells (rise and decline) is discussed on the basis of 10 water gage station recordings of a summer flood in July 1949 on a 106.9 km long section of the Vistula River between the confluence of the Skawa and Raba. It shows that variations of the river level depend on the changing width of the river bed and the discharge. *Subject Headings:* **1. Water level variations 2. River stages 3. River discharges 4. Vistula River, Poland.**—*A.M.P.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See also: **Pan-climatic testing** (Dummer et al.), 7.8–44.

7.8–220 551.58:551.311.17(99)

†Loewe, F., **Contributions to the glaciology of the Antarctic.** *Journal of Glaciology*, 2(19):657–665, March **1956.** fig., 6 tables, 26 refs. English and German summaries p. 657. **DWB**—Average wind at Point Martin, Adélie Land, was 29 m/s in March 1951. At Pt. Géologie 40 mi to west it was only half as strong. Snow deposits are entirely rounded wind-driven grains in dunes and sastrugi, the density of surface layers exceeding 0.4. The annual accumulation equals 25–30 cm water. Radiation balance at Port Martin is negative except in Dec.–Jan., on ice cap except in Dec. The loss is made good by influx of warmer sea air. Snow temperatures are lower at 1 cm than at 20 cm and also lower than air temperature. Mean annual temperature on ice cap varies from 10°F at MSL to −30°F at 6400 ft. On a blizzard day 240,000 tons of drifting snow are estimated to cross each km of coast. (*Same item as* 7G–222, July 1956, *MAB*.) *Subject Headings:* **1. Antarctic glaciology 2. Blizzards 3. Radiation balance 4. Adélie Land.**—*C.E.P.B.*

CLIMATIC ZONES

7.8–221 551.581

Alisov, B. P., **Problém širkové podnební pásmitosti.** [Problems of latitudinal climatic zonality.] *Meteorologické Zprávy*, Prague, 7(1):23–25, Feb. **1954.** fig., 6 refs. **DLC**—Translation by J. Spirhanzl of Allisov's **Problema shirotnoĭ klimaticheskoĭ zonal'nosti** (*see item* 5.9–264, Sept. 1954, *MAB*), including his world map of latitudinal climatic classification. *Subject Headings:* **1. Climatic classifications 2. Climatic zones 3. Translations. I. Spirhanzl, J.** (*trans.*).—*G.T.*

CLIMATE OF PARTICULAR PLACES

7.8–222 551.582(94

Greenwood, Richard H., **Die geographische Gliederung von Queensland. Eine Übersicl über die regionalen Verschiedenheiten der Landschaften und der Produktionsfähigkeit de Staates.** [The geographical divisions of Queensland. A sketch of the regional differences landscape and production potential of the state.] *Die Erde*, Berlin, 3/4:239–260, 195 11 figs. **DLC**—Includes a section on climate with a rainfall map. Soils and natural vegetatic are described, then the separate natural regions. *Subject Headings:* **1. Climate of Queenslan 2. Queensland, Australia.**—*C.E.P.B.*

7.8–223 551.582(6):632.

†Guichard, K. M., **Habitats of the desert locust (*Schistocerca gregaria* Forskål) in Weste Libya and Tibesti.** *Anti-locust Bulletin*, London, 21, **1955.** 33 p. 24 figs., 8 tables, 15 ref **DLC**—The vegetation and climate (highly variable) of these desert areas are fully describe with tables. The presence, migrations and breeding of locusts is governed by the incidenc of rainfall. *Subject Headings:* **1. Desert climates 2. Locusts 3. Libya 4. Tibesti.**—*C.E.P.B.*

7.8–224 551.582(988):551.578.4

Miller, David H., **The influence of snow cover on local climate in Greenland.** *Journe of Meteorology*, Boston, 13(1):112–120, Feb. **1956.** 5 figs., 2 tables, 49 refs. **DWB**—Voe KOV's classic theory of effect of snow cover on climate is revised using observations on th Greenland inland ice. In winter during storms heat is brought in by advection and sub sidence, and loss by long wave radiation is decreased. This heat is stored in the lower air an surface layer of snow. Between storms it is dissipated by long wave radiation and a loca climate develops. The cycle lasts 7½ days and storage and dissipation amount to 100–15 cal/cm². In summer there is a similar diurnal cycle, storage and dissipation between perioc of high and low sun amounting to about 30 cal/cm². These thermal balances are shown i tables and graphs. (*Same item as* 7G–223, July 1956, *MAB.*) *Subject Headings:* **1. Sno cover effects on microclimatology 2. Heat balance 3. Climate of Greenland 4. Gree land.**—*C.E.P.B.*

7.8–225 551.582(81) 551.585(81

Souto Maior, Ariadne Soares (*Brazilian Nat. Council of Geog.*), **Tipos climáticos d Distrito Federal.** [Climatic types of the Federal District.] *Revista Brasileira de Geografic* Rio de Janeiro, 16(2):267–275, April/June **1954.** 2 figs., 2 tables, 15 refs. **DWB, DLC**— The climatic types (Köppen) found in various parts of the Federal District (which include the city of Rio de Janeiro) of Brazil are discussed and general climatic data for a score stations in the District presented and discussed. Data include mean temperature of th coldest and warmest month (July and Feb. at most places), and monthly and annual mea precipitation for period 1928–1948 (in a few cases records go back to 1919 or 1914). Tota for year varies from 1050 to 1750 mm. Year to year variations are not given. The discussio mainly concerns the effects of mountains, bays or coast and conditions on islands, with respec to temperature and moisture. *Subject Headings:* **1. Climate of the Federal District, Braz 2. Climatic types 3. Köppen's classification 4. Federal District, Brazil.**—*M.R.*

7.8–226 551.582:551.585.55(56):633.

Walter, Heinrich, **Das Problem der zentralanatolischen Steppe.** [The problem of th Central Anatolian steppe.] *Naturwissenschaften*, Berlin, 43(5):97–102, March 1, **195** 6 figs., refs. **DWB**—Central Anatolia was already treeless when settlement began 4000 yea ago, but the remainder of Anatolia was at one time forested, the boundary being at abou 1100 m in the north and 1400 m in the south. The steppe is due to low rainfall (336–377 mm with extreme drought from beginning of June to mid-Oct.; winters are very cold. The regio was originally grassland but has been turned into semi-desert by thousands of years of grazing Some climatic diagrams are given. *Subject Headings:* **1. Climate of Anatolia 2. Stepp climates 3. Grazing effects 4. Anatolia.**—*C.E.P.B.*

7.8–227 551.582.1(43)

Creutzburg, Nikolaus, **Die Natur der Landschaft in Freiburg und der Breisgau.** [Nature of the landscape in Freiburg and Breisgau.] *Naturforschende Gesellschaft zu Freiburg im Breisgau, Bericht,* 44:13–73, **1954.** table, figs. (incl. photos). **Das Klima** [The climate]. p. 62–73. **DWB**—The Freiburg im Breisgau Society of Naturalists, in its 44th volume of reports, presents a guide-book compiled by various authors, on the city and province of Freiburg giving ample information on its history and geography, climate, nature and structure of its landscape, conditions of its agriculture and forestry, the history of its art and architecture. In the chapter dealing with the climate, p. 62–73, the territory is divided into two distinct zones—the warmer Upper Rhine, piedmont lowland with the neighboring (up to 300 m high) foothills of the surrounding mountains (with a 10.3°C mean yearly temperature) and the cooler hilly Black Forest zone. The author discusses separately and comparatively the characteristic features of the climate of both zones in connection with various weather situations and the effect of rain and snowfalls, winds and fogs in various sections of the region on the temperature and humidity. *Subject Headings:* **1. Climate of Freiburg 2. Freiburg, Germany.** —*A.M.P.*

7.8–228 551.582.2(437)

*Hambálek, Josef, **Vhodnost Pankrácké pláně a prilehlých svahů pro sidlištní účely z hledisek bioklimatických.** [Bioclimatological suitability of the Pankrac plateau and adjacent slopes for settlement purposes.] *Meteorologické Zprávy,* Prague, 8(1):11–14, Feb. 28, **1955.** 8 tables. Russian and German summaries p. 11. **DWB**—Climatological data for the Pankrac plateau are presented and discussed (precipitation, cloudiness, sunshine, fog, humidity, snow, snow cover, temperature regime, wind; 1921–1950). According to climate classifications of Lang, Gregor and Miňář, this section of Prague is identified as a dry, warm, sunny and well ventilated region, suited for settlement purposes, except for the northeastern slopes which are exposed to obnoxious winds and have little sunshine and polluted air. *Subject Headings:* **1. Climate of Prague 2. Urban climates 3. Climatic classifications 4. Prague, Czechoslovakia.**—*G.T.*

CLIMATIC CHANGES

See also: **S. Steering of pressure fluctuations** (Schove), **7.8–172.**

7.8–229 551.583.14:551.311.12(79)

Harrison, A. E., **Glacial activity in the western United States.** *Journal of Glaciology,* London, 2(19):666–668, March **1956.** 3 figs., 12 refs. English and German summaries, p. 666. **DWB**—Recent measurements of Nisqually Glacier on Mt. Rainier, Palisade and Lyell Glaciers in Sierra Nevada and Coleman Glacier of Mt. Baker indicate growth in thickness though ends of some are still retreating. There is a general tendency towards glacial growth. *Subject Headings:* **1. Glacier variations 2. Nisqually Glacier, Wash. 3. Sierra Nevada 4. Cascade Mts.**—*C.E.P.B.*

7.8–230 551.583.14:551.311.12(797)

Hubley, Richard C., **Glaciers of the Washington Cascade and Olympic mountains; their present activity and its relation to local climatic trends.** *Journal of Glaciology,* London, 2(19):669–674, March **1956.** 8 figs., 2 tables, 3 refs. English and German summaries, p. 669. **DWB**—Of 73 glaciers in Olympic and Cascade Mts. of Washington, 50 have advanced in 1950–55 by 3–112 m a year, and 22 of the remainder are probably increasing in thickness. Growth started about 1943. At Tatoosh Island mean annual temperature, after rising until 1943, has since fallen by 0.8°C. Precipitation has increased by about 38 cm. *Subject Headings:* **1. Glacier variations 2. Climatic trends 3. Washington** (state) **4. Tatoosh Island, Wash.**—*C.E.P.B.*

7.8–231 551.583.2:551.311.12(234.3)

Förtsch, O. and Vidal, H., **Vorausberechnung des Rückganges der Ostalpengletscher. Veranschaulicht am Hintereisferner** (Ötztaler Alpen). [Precalculation of retreat of East

Alpine glaciers, on the Hintereis glacier.] *Zeitschrift für Gletscherkunde und Glazialgeologie* Innsbruck, 3(2):171–180, **1956.** 2 figs., 2 plates, 2 tables, 4 refs. German and English summaries p. 179–180. **DLC**—The mean annual ablation of E. Alpine glaciers ranges from 3.8 m at 2050 m to very small or nil at 3450 m. The annual loss is calculated since 1854 and it is found that, if the present climate continues, the glacier tongues will decrease from 0.44 km in 1954 to 0.08 in 2154 and vanish by 2240. *Subject Headings:* **1. Glacier retreat 2. Ötztal Alps.**—*C.E.P.B.*

7.8–232 551.583.2:551.311.12(797)

Harrison, A. E., **Fluctuations of the Nisqually Glacier, Mt. Rainier, Washington, since 1750.** *Journal of Glaciology*, London, 2(19):675–683, March **1956.** 4 figs., 12 refs. English and German summaries, p. 675. **DWB**—Moraines dated 1750 (from age of trees), 1855, 1884 and 1907 are mapped and condition of glacier described. Measurements at frequent intervals are tabulated and plotted. An advance terminated about 1750; subsequent retreat was interrupted by advances about 1855, 1884 (slight) and 1907. An increase of thickness began about 1945 and spread downwards as a wave. *Subject Headings:* **1. Glacier variations 2. Nisqually Glacier, Wash.**—*C.E.P.B.*

7.8–233 551.583.2:551.311.12(546)

Pillewizer, Wolfgang, **Der Rakhiot-Gletscher am Nanga Parbat im Jahre 1954.** [The Rakhiot Glacier, Nanga Parbat, in 1954.] *Zeitschrift für Gletscherkunde und Glazialgeologie* Innsbruck, 3(2):181–194, **1956.** 3 figs., plate, table. English summary p. 194. **DLC**—Profiles of the glacier are given. The movement was more rapid in 1954 than 1934, probably due to increased nourishment from the firn. In 1934–1954 the glacier receded 450 m (from 3176 to 3210 m). The climatic snow line is at 4700–4800 m. *Subject Headings:* **1. Glacier retreat 2. Nanga Parbat, Kashmir.**—*C.E.P.B.*

7.8–234 551.583.2:551.311.12(984)

Sweeting, Marjorie and Groom, Gillian, **Notes on the glacier fluctuations in Bünsow Land, central Vestspitsbergen.** *Journal of Glaciology*, London, 2(19):640–641, March **1956.** 2 figs., 7 refs. English and German summaries p. 640. **DWB**—Precipitation is less than 380 mm a year. Thin ice caps on plateau summits give rise to short glaciers. All those examined in 1953 showed marked regression since 1938 in the north and 1925 in the south. The plateau ice caps are thinning so rapidly that they are becoming unable to replenish their dependent glaciers. *Subject Headings:* **1. Glacier variations 2. West Spitsbergen.**—*C.E.P.B.*

7.8–235 551.583.3:551.311.15(433)

Ebers, Edith, **Der bayerische Anteil des Salzach-Gletschers: vorläufiger Bericht.** [The Bavarian part of the Salzach glacier: preliminary report.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 3(2):255–256, **1956.** **DLC**—Summary of glacial formations dated as Mindel, Riss, Würm and Würm retreat stadia. *Subject Headings:* **1. Quaternary glaciation 2. Bavaria.**—*C.E.P.B.*

MICROCLIMATOLOGY

See also: **Tropical soils** (Mohr), 7.8-6; **Vertical temp., humidity and wind gradients** (Frankenberger), 7.8-8; **Nocturnal heat exchange of frozen glacier surface** (Ambach), 7.8–40; **Min. temp. and topography** (Lawrence), 7.8–160; **Aerial spraying, East Africa** (Thompson), 7.8–176.

7.8–236 551.584:553.62

Ruttner-Kolisko, Agnes, **Einige Beispiele für die unmittelbare Auswirkung des Wetters auf die Lebensbedingungen im feuchten Sand.** [Some examples of the direct effect of weather upon living conditions in moist sand.] *Wetter und Leben*, Vienna, 7(1/2):16–22, **1955.** 2 figs., table, ref. **DWB**—The dependence of the "psammon" (biocoenose along sandy shores of lakes or rivers) biotope at Tornetrask (Swedish Lapland), at Erken (Central Sweden) and at Lake Maggiore upon local climatic factors was investigated. The author discusses the effect of incoming radiation upon temperature conditions in sand, the effect of rain upon

chemical conditions in sand and the effect of flood water upon organisms in the sand. *Subject Headings:* **1. Sand microclimatology 2. Sweden 3. Italy.**—*I.L.D.*

7.8–237 551.584.41:634.94

*Ross, R. (*British Museum of Natural History*), **Secondary succession in the Shasha Forest Reserve** (**Pt. 3 of Ecological studies on the rain forest of Southern Nigeria**). *Journal of Ecology*, London, 42(2):259–282, July **1954.** 7 tables, 2 figs., 4 refs., 10 photos. **DLC**—In this study, the author examines the course of the secondary succession of cultivation in a primary rain forest area of Southern Nigeria. CO_2 concentration, light intensity, air temperature and humidity at 0.6 m and 16 m above the ground were studied and the results are compared with those of EVANS for a primary forest. *Subject Headings:* **1. Forest succession 2. Forest microclimatology 3. Southern Nigeria.**—*I.L.D.*

7.8–238 551.584.9:591.56:598.6

Frith, H. J., **Wie regelt der Thermometervogel die Temperatur seines Nesthügels?** [How does the thermometer bird regulate the temperature of its nest-hill?] *Umschau*, Frankfurt, a.M., 56(8):238–239, April 15, **1956.** 5 figs. **DLC**—The Australian "Thermometer bird" *Leipoa ocellata* builds a ring-shaped nest about 5 m across. In the central hollow it collects organic material, the decay of which keeps the temperature nearly constant about 34.5°C, while air temperature ranges from 16–49°C. Overheating during the day in summer is avoided by a layer of earth up to 10 cm deep over the eggs, added to in the cool of early morning. Author built artificial nests with thermometers and heat flow meters. *Subject Headings:* **1. Microclimatology of nests 2. "Thermometer bird."**—*C.E.P.B.*

CLIMATIC CLASSIFICATION

See: **Transformation of steppes** (Dokuchaev), 7.8–2; **Climatic types, Brazil** (Souto Maior), 7.8–225; **Central Anatolian steppe** (Walter), 7.8–226.

BIOCLIMATOLOGY

See also: **Microclimate and ind. hygiene** (Magos), 7.8–45; **UV radiation** (Schulze), 7.8–152.

7.8–239 551.586:572.9

Reche, Otto, **Zur Frage der Brauchbarkeit physiologischer Hauteigenschaften für Schlussfolgerungen auf die Bildungsheimat menschlicher Biotypen.** [On the value of physiological skin properties as indications of the original home of human biotypes.] *Forschungen und Fortschritte*, Berlin, 30(3):68–71, March **1956.** 4 refs. **DLC**—Naked early human races became adapted, over many thousand years, to their environment by the survival of favorable mutations, especially of the skin. The African negro evolved in a sunny tropical steppe, the bright-eyed blond eurythermal North European in a cool damp cloudy home with rapid temperature changes and little infrared and UV radiation. A climate, resembling that of S. Greenland now, prevailed in N.W. Europe at the close of the ice-age. The climate of E. Europe and N. Africa, favored by W. BRANDENSTEIN as their original home, is too continental; the original south Europeans were a brown race. *Subject Headings:* **1. Human races 2. Bioclimatology.**—*C.E.P.B.*

7.8–240 551.586:575

Man walks upright because of snow, ice. *Science News Letter*, 67(17):258, April 23, **1955. DWB**—This theory was presented at the meeting of the Federation of American Societies for Experimental Biology in San Francisco by DR. SYDNEY W. BRITTON. The upright position and movement of three chimpanzees studied in Africa, England and in Virginia are a function of the adrenal glands. The chimpanzees, normally traveling on all fours, walked on their hind feet over rough, wet, icy, and especially over snowy ground. *Subject Headings:* **1. Biometeorology 2. Adrenal glands 3. Environmental physiology.**—*W.N.*

7.8–241 551.586:58

Hallaire, Marc and Nigond, Jacques, **Action de la température sur le développement des organismes dans les conditions naturelles.** [Effect of temperature on the development of organisms under natural conditions.] *Académie des Sciences, Paris, Comptes Rendus*, 236(2):230–232, Jan. 12, **1953.** ref. **DWB**—Using 30 days temperature for Khartoum, Cairo, Versailles, Moscow and Uppsala, the authors show the dispersion of points from the mean curve (as established by Thornthwaite's Plant Development Formula) when hourly instead of daily mean temperatures are used for different locations. For a 30-day period the means give results with an accuracy of 10% (of hourly values). However, if six-month period is used, the dispersion is greater due to the great variation in the amplitude of annual temperature cycle. *Subject Headings:* **1. Plant development curve 2. Bioclimatic research 3. Temperature summations. I. Thornthwaite, C. W.**—*M.R.*

7.8–242 551.586:612.5:636.

Bligh, John (*Hannah Dairy Res. Inst., Kirkhill, Ayr., Ireland*), **Comparison of rectal and deep body temperature in the calf.** *Nature*, London, 176(4478):402–403, Aug. 1955. 2 figs., 5 refs. **DLC**—The author investigated the validity of using rectal temperatures as a measure of deep body temperatures in Ayrshire bull calves, four to six months old. The temperature in the face-flowing arterial blood in the bicarotid trunk was measured with a copper-constantan thermometer and compared with that of the rectal temperature under various temperature and humidity combinations in the climatic chamber. In all five animals the carotid blood temperature was 0.1–0.3°C below that of the rectum at every low humidity exposure. At the environmental conditions of 40°C and high humidity the difference between carotid and rectum temperatures disappeared; sometimes the temperature of the former was slightly higher. *Subject Headings:* **1. Body temperature 2. Animal bioclimatology.**—*I.L.D.*

7.8–243 551.586:616

Hisdal, Vidar, **The influence of weather on mortality.** *Meteorologiske Annaler*, Oslo, 3(10):257–283, **1953.** 8 figs., 7 tables, 11 refs. **DWB**—Using the mortality statistics of Oslo for the period 1934–38, the author, with the aid of the statistical tests such as the chi-square test and "Students'" t-distribution, analyzed the relationship between mortality and 1) interdiurnal change of temperature and 2) frontal passage. A day with an appreciably higher mean temperature than the previous day is likely to have a higher mortality than a day with a drop in the mean temperature. A day with a marked change of air masses caused by the passage of a cold front is apt to be connected with a higher death rate than the two preceding or following days. *Subject Heading:* **1. Weather influences on mortality.**—*I.L.D.*

7.8–244 551.586:616.12

†*Heyer, Howard E.; Teng, H. C. and Barris, William, **The increased frequency of acute myocardial infarction during summer months in a warm climate: a study of 1,386 cases from Dallas, Texas.** *American Heart Journal*, St. Louis, 45(5):741–748, May **1953.** 2 figs., 2 tables, 27 refs. **DLC**—A survey of the monthly and seasonal frequency of occurrence in a series of 1386 cases of authenticated myocardial infarction in Dallas, Texas, showed that the greatest number of cases occurred during the summer months and the lowest during the winter months. The increased summer frequency of this disease differs entirely from reported seasonal incidence in Northern United States cities where the greatest number of cases are found during the winter months. A table contains a summary of the monthly incidence of myocardial infarction reported in previous studies. *Subject Headings:* **1. Bioclimatology 2. Heart disease.**—*I.L.D.*

7.8–245 551.586:616.2

Markow, Harry and Reicher, Jacob, **The effect of meteorologic conditions on asthmatic patients.** *New York State Journal of Medicine*, 53(22):2675–2681, Nov. 15, **1953.** 7 figs., 34 refs. **DLC**—A review of the medical literature dealing with the effects of meteorological factors upon allergic patients over short periods of time and the report of a study in which the reactions of 90 perennially asthmatic patients were investigated in relation to temperature,

relative humidity, barometric pressure and total rainfall are presented. The monthly average of the patient's reactions indicate that no definite correlation exists between asthmatic symptoms and meteorological factors but they suggest a trend in relation to temperature, humidity and rainfall. *Subject Headings:* **1. Medical meteorology 2. Asthma.**—*I.L.D.*

7.8–246 551.586:616.925

Topitz, A., **Virusinfekte und Wetter.** [Virus infection and weather.] *Wetter und Leben*, Vienna, 7(3/4):79, **1955. DLC**—Some statistics on the relationship between warm weather and occurrence of incidence of poliomyelitis are presented. It is suggested that every case of infection should be studied not only in relation to the local climate but also to the house and clothing climate. *Subject Headings:* **1. Medical meteorology 2. Poliomyelitis.**—*I.L.D.*

7.8–247 551.586:631.6:551.573

Thornthwaite, Charles W., **Climate and scientific irrigation in New Jersey.** *Johns Hopkins Univ. Laboratory of Climatology, Publications in Climatology*, 6(1), **1953.** 8 p. **DWB**—The purpose of supplemental irrigation in humid regions like Southern New Jersey is stated to be the production of bumper crops every year, and not the occasional saving of a crop during years of extreme drought. In order to do this scientifically (to irrigate soon enough but not to over-irrigate) the author has experimented with methods of measuring evapotranspiration, which when it exceeds rainfall indicates a need for supplemental irrigation and gives a simple index of how much to irrigate. By using these methods in New Jersey author predicts a great increase in productivity can be reached in a few years. *Subject Headings:* **1. Evapotranspiration 2 Supplemental irrigation 3. Crop yield 4. New Jersey. I. Johns Hopkins Univ. Laboratory of Climatology.**—*M.R.*

7.8–248 551.586:633.18

Satō, S. (*Kyushu Agric. Exp. Station*), **The optimum conditions of climate for the rice-culture in the warm districts in Japan.** *Journal of Agricultural Meteorology*, Tokyo,10(3/4): 84–86, March **1955.** 2 figs., 5 refs. **DWB**—The authors investigated the most simple method to represent the climatic conditions in rice-cultivating season in warm districts, and shows it on diagrams. The optimum air-temperature for the crop growth is at 27°C or so in summer (July and Aug.). The longer the duration of sunshine in autumn (Sept. and Oct.), the greater is the yield at every locality in Kyushu. *Subject Headings:* **1. Rice culture 2. Crop yield 3. Rice ecology 4. Japan.**—*Author's abstract.*

7.8–249 551.586:634:551.573(68)

de Villiers, G. D. B. (*Stellenbosch Fruit Research Station*), **Studies relating to the physical effects of dormant oil sprays.** *South Africa. Dept. of Agriculture, Fruit Research, Technical Series*, No. 7, **1946.** 20 p. 10 figs., 4 tables, refs. *South Africa. Dept. of Agriculture, Science Bulletin*, No. 250. Price: 3 d. **DWB**—The apparatus and methods used in measuring: a) the absorption of ultra-violet light and b) the effect on water loss from dormant peach twigs, due to thin films of various oils and oil emulsions are described and illustrated. The absorption of ultra-violet radiation was found to be insignificant, as shown in the absorption spectra reproduced. Comparative data on the water loss from sprayed and unsprayed twigs are tabulated and show a decrease of the order of 50% in water loss due to a 5% oil emulsion. Data on evaporation as a function of climatological factors such as intense radiation and wind are presented in tables and graphs for the hot spring months Aug. and Sept. The author concludes that "the conservation of water by an oil spray, especially after mild winters and before hot spells undoubtedly contributes towards the beneficial effect of an oil spray in general." *Subject Headings:* **1. Fruit culture 2. Orchard spraying 3. Evaporation 4. Bioclimatology 5. South Africa.**—*G.T.*

SYNOPTIC CLIMATOLOGY

See: **Climatological aspects of baric depressions** (Schwerdtfeger), 7.8–135.

MISCELLANEOUS

SOLAR INFLUENCES

See also: **Tilts in ionosphere during solar eclipse** (Bramley), 7.8–107; **Ionospheric solar eclipse, Dec. 25, 1954** (Szendrei, McEthinny), 7.8–115.

7.8–250 551.590.21:523.74

Schove, D. Justin (*St. David's College, Beckenham, Kent, Eng.*), **Sunspot cycle, 649 B.C. to A.D. 2000.** *Journal of Geophysical Research*, Wash., D. C., 60(2):127–146, June 1955. tables, fig., 18 refs. **DWB**—Annual sunspot numbers since 1700 and the known maxima and minima since 1610 show a similarity of pattern from century to century. This suggests that the mean cycle is approximately 11⅛ years. The records of sunspots and aurorae enable magnitudes and dates of sunspot maxima since at least A.D. 300 to be estimated. The constancy of the mean cycle over long periods enables the number of missing maxima to be calculated, and, using certain general principles, a table of minima complete since at least 200 B.C. can be established. A 78-year cycle appears to exist in the length of the sunspot cycle and an irregular cycle of about 200 to 205 years may exist in auroral intensity. A characteristic pattern in even centuries enables some predictions to be made for the next 50 years. Intervals between intense maxima in the range 200 to 1,000 years apart show clusters at certain values; these values are close to multiples of 11.11. Intervals between well-dated maxima since A.D. 300 are often slightly less than such multiples, for example, 554 instead of 555; from B.C. 200 to A.D. 300, intervals are slightly greater. In classical and early medieval times the cycle was thus slightly less. The variability of the sunspot cycle is only apparent. The fundamental rhythm of 11.1 years (together with the 78-year cycle) is constant through the centuries; temporary aberrations are partly due to variations in sunspot intensity, inasmuch as active cycles tend to become "early" and weak cycles "late." *Subject Heading:* **1. Sunspot cycles.**—*Author's abstract.*

7.8–251 551.590.25:621.396.9

Briggs, B. H., **Observations of short bursts of signal from a distant 50 Mc/s transmitter.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(3):171–183, March 1956. 8 figs., table, 12 refs., 9 eqs. **DWB**—Signal bursts from Kirk o' Shotts television station were recorded at Cambridge, 480 km away. The histogram of time intervals between bursts is fitted by the expected curve if they occurred at random, but there is some evidence that a few occur in trains of three. Two types of wave were found, one with rapid exponential decay, the other maintained for 2–3 sec, usually with fluctuations of amplitude. It is concluded that most if not all the bursts are reflections from meteor trails and that most of them come from near the receiver. *Subject Heading:* **1. Meteor echoes.**—*C.E.P.B.*

7.8–252 551.590.25:551.501.81

McKinley, D. W. R., **Radar-echo duration and height of a Perseid meteor.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):76–82, Feb. 1956. 4 figs., 2 tables, 7 refs. **DWB**—Three-station radar observations of a Perseid meteor on Aug. 12, 1948, in Canada, lasting 549 sec, enabled path to be determined. The enduring echo at 91 km drifted eastward at 119 m/s. Additional diffuse echoes may be due either to ground scatter or to meteoric ionization above 130 km. *Subject Heading:* **1. Radar echoes from meteors.**—*C.E.P.B.*

VISIBILITY

7.8–253 551.591:656.71

Rose, H. W., **Luminance of the horizon and dark adaptation during meteorological visibility observations.** U. S. Air Force School of Aviation Medicine, Randolph Field, Texas, Project 21-24-008, Report No. 1, July 1950. 7 p. 4 figs. **DWB**—Strong local light sources as well as failure to adapt to dark after coming from a brightly lighted airport weather office, may result in visibility observations at night which are far from representative of conditions encountered by a pilot when landing. Numerous observations of office, background and object (visibility marker light) were made with a Schmidt and Haensch universal photometer model

no. 1 calibrated by comparison with standard light sources at the N.B.S. in Washington. The observations were made at 3 small military, 6 large military and 5 large city airports from D.C. to Los Angeles and Seattle in June, July and Aug. (1949?). Results shown on scatter diagrams indicate need for larger period of adaptation (6 min.) and radiation of background illumination. *Subject Headings:* **1. Visibility observations 2. Dark adaptation 3. Airport observation. I. U. S. Air Force School of Aviation Medicine, Randolph Field, Texas II. Project 21-24-008.**—*M.R.*

OPTICAL PHENOMENA

7.8–254 535.4:551.593.1

†Birnbaum, George and Bussey, H. E. (*both, National Bureau of Standards, Boulder, Colo.*), **Amplitude, scale, and spectrum of refractive index inhomogeneities in the first 125 meters of the atmosphere.** *Institute of Radio Engineers, N. Y., Proceedings,* 43(10):1412-1418, Oct. **1955.** 3 figs., 2 tables, 13 refs., eqs. **DLC**—An extensive series of observations was obtained with two refractometers and meteorological equipment installed on various levels of a 128-meter tower at the Brookhaven National Laboratory, Long Island, New York. One of the refractometers was equipped with a multiple cavity unit for the study of correlation between two positions in the horizontal direction. The errors arising from the exposure of the cavity to the atmosphere and its ventilation were investigated. The amplitude of the refractive index variations could be correlated with various meteorological conditions. From the experimentally determined cross-correlation coefficient, and assuming that its variation with distance is given by the exponential (Taylor) form, scales in the neighborhood of 60 meters were obtained. A crude analysis of the data indicated that the intensity of the refractive index inhomogeneities varied, on the average, as the 1.6 power of their size. *Subject Headings:* **1. Refractive index 2. Refractometers.**—*Authors' abstract.*

7.8–255 551.593.1

*Strand, Kaj G., **Investigation of atmospheric refraction at low altitudes.** *U. S. Arctic, Desert, Tropic Information Center, ADTIC Publication,* No. A-102, Feb. **1953.** 36 p. 3 figs., 13 tables, 4 refs. **DWB**—Refractive indexes are computed from observations made in 1951 and 1952 at Dearborn Observatory about 60 ft from the west shore of Lake Michigan near Chicago, supplemented by Joliet radiosonde data for selected days in 1951 and 1952. It is realized that the air over Joliet is not the same as over Lake Michigan, yet conditions at 3,000 ft are not so much different that data cannot be used interchangeably. Observations of the Pleiades and Moon were used to determine refraction effect. Techniques are described in detail and illustrated, and meteorological as well as astronomical data presented in full. Pressure, temperature and dew-point are used for surface and up to 24,000 ft and tabulated and measured values are compared, indicating that on individual nights observed values may differ by as much as 8% from computed values, when corrections for surface pressure and temperature are applied. *Subject Headings:* **1. Atmospheric refraction 2. Astronomical refraction 3. Tropospheric refraction 4. Lake Michigan.**—*M.R.*

7.8–256 551.593.12:551.551:551.557

Protheroe, William M. (*Perkins Obs., Delaware, Ohio*), **Determination of shadow band structure from stellar scintillation measurements.** *Optical Society of America, N. Y., Journal,* 45(10):851-855, Oct. **1955.** 6 figs., table, 6 refs., eqs. **DLC**—The autocorrelation functions of the light intensities in stellar shadow bands have been determined for two nights in March 1954. These functions show that the stellar shadow bands are correlated over a distance of eleven inches, the limit to which observations were made; that the predominant element size is of the order of 5 to 10 in.; and that the pattern elements are elongated in the direction of motion of the pattern. The pattern appears to have a translational motion which correlates both in direction and magnitude with atmospheric wind velocities in the neighborhood of the 200 mb level. *Subject Headings:* **1. Turbulence in the stratosphere 2. Upper air winds 3. Scintillation.**—*Author's abstract.*

7.8–257 551.593.55:551.521.3

Donahue, T. M. and Resnick, Robert (*both, Univ. of Pittsburgh*), **Resonance absorption of sunlight in twilight layers.** *Physical Review*, N. Y., 98(6):1622–1625, June 15, 1955. 4 figs table, 9 refs., 14 eqs. **DWB**—Solar radiation must pass at least once through the absorbin layer to reach the twilight zone of a layer of atoms scattering resonance radiation. Th attenuation of the solar beam is calculated for resonance absorption and the resulting scattere intensity compared with the transparent layer model intensity for the same thickness o material. It is shown that in the case of sodium, the reduction in intensity for layers thicke than 10^9 atoms/cm^2 is too serious to permit the deduction of layer thickness from a simpl theory which neglects imprisonment of resonance radiation. *Subject Headings:* **1. Twilig radiation 2. Absorption 3. Resonance radiation.**—*Authors' abstract.*

7.8–258 551.593.6

Ball, P. E. J., **Corona display.** *Weather*, 11(3):97, March 1956. 3 figs. **DWB**—Harrow Oct. 25, 1955, corona with a yellow center and blue, red and silver rings. Later the yellow center was tinged with green. *Subject Heading:* **1. Coronas.**—*C.E.P.B.*

7.8–259 551.593.7:551.593.5

Rozenberg, G. V., **Poliarimetriia sumerechnogo neba.** [Polarimetry of the twilig sky.] *Akademiia Nauk SSSR, Geofizicheskiĭ Institut, Trudy*, No. 12(139):35–49, 1950 8 figs., table, 30 refs., 13 eqs. **DLC**—Reviewing the polarimetric investigations of twilig sky zenith, the author analyzes polarization anomalies and studies the influence exerted by various conditions of the ionosphere. Dependence of polarization upon the height of scattering layer is shown by graphs for Crimea (1939) and Moscow (1940). A rapid decrease in polarization has been noticed very often around 200 km height. *Subject Heading:* **1. Twilight polarization.**—*N. S. Zikeev.*

ELECTRICAL PHENOMENA

See also: **Earth's elec. field** (Garber), 7.8–9; **Electric charges when blowing snow** (Norinder, Siksna), 7.8–12; **Atmos.-electrical problems of stratosphere res.** (Dieckmann), 7.8–56; **Upper atmos. meteors** (Öpik), 7.8–103; **Radio wave fading** (Bowhill), 7.8–106.

7.8–260 551.594

Chalmers, J. Alan, **The electrical charge on the earth.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):124–125, Feb. 1956. 5 refs. **DWB**—Comments on paper by J. F. Clark and J. H. Kraakevic (*J. of Atmos. and Terr. Phys.*, 6(6):344–345, June 1955; *see* 7.1–345, Jan. 1956, *MAB*), deriving the same result if there are 3600 thunderstorms in action at once, which is reasonable. *Subject Heading:* **1. Atmospheric electricity theories.**—*C.E.P.B.*

7.8–261 551.594.1

Mühleisen, R., **On the deviations of the course of elements of atmospheric electricity on continents from the worldwide course.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(3):146–157, March 1956. 14 figs., 17 refs., 3 eqs. **DWB**—To detect the causes of diurnal variations of potential gradient and air-earth current and their deviations from ocean variations, author made measurements in fine weather in various parts of Stuttgart and in the village of Weissenau of electrical quantities, small ions, wind direction and daylight. The signs of space charges produced by exhaust, smoke and steam clouds and fires were recorded, and differences under the same conditions between week-days and Sundays, and winter and summer, also laboratory experiments. He found mainly positive space charges, produced by artificial action and carried many kilometers by the wind. He concludes that records of potential gradient and air-earth current are of local value only. The space-charge should be measured at various altitudes including tops of mountains. *Subject Headings:* **1. Atmospheric electricity 2. Potential gradient variations.**—*C.E.P.B.*

7.8–262 551.594.12:533.6:551.551

Gallet, R. M. (*Nat. Bur. Standards, Boulder, Colo.*), **Aerodynamical mechanisms producing electronic density fluctuations in turbulent ionized layers.** *Institute of Radio Engineers,*

N. Y., Proceedings, 43(10):1240–1252, Oct. 1955. 8 figs., table, 7 foot-refs., bibliog. p. 1252, numerous eqs. **DLC**—Various radio effects of the turbulence in the low ionosphere are discussed with a view toward determining the order of magnitude of the turbulence parameters in this region. These effects include vhf scattering, sporadic E layer phenomena, and diffraction patterns in reflection. The required electron density fluctuations $\overline{(\Delta N/N)^2}$ fluctuate around 10^{-2} and the scale of the turbulence l is roughly 100 to 200 m. The latter quantity measured directly in the troposphere is of about the same order of magnitude. The underlying purpose of the paper is to study the aerodynamical mechanisms of turbulence. Pressure fluctuations result from the "collisions and extensions between turbulent eddies" in a uniform gas, or from vertical transport in the atmosphere with its varying pressure. It is shown that such pressure fluctuations are too small, by a factor of about 10^{-4}, to produce the observed density fluctuations. However, the vertical transport mechanism produces two other effects which are independent of the energy of the turbulence and are of the right order of intensity. First, in a nonadiabatic atmosphere the vertical transport of air masses produces fluctuations of temperature. These, in turn, give rise to air density fluctuations, and proportional electron density fluctuations. Second, fluctuations of electron density result directly from transport in the presence of a gradient of electron density. These two effects, for the same uniform turbulence, occur at different levels in an ionospheric layer. They are sufficient to explain the stratification properties of sporadic E. An expression for the scale of turbulence is obtained from the gradients of winds circulating in the low ionosphere. Hence, the properties of sporadic E phenomena should be interpreted in terms of meteorological factors (winds, synoptic masses of air, fronts, etc.). It is pointed out that the same transport mechanisms are acting in the troposphere, the gradients of water vapor content playing the role of the gradients of electron density. *Subject Headings:* **1. Electron density 2. Aerodynamics 3. Atmospheric turbulence.**—*Author's abstract.*

7.8-263 551.594.12:551.510.535

Ghosh, Mrinmayee, **Determination of the *F*-region collisional frequency over Calcutta.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):116–118, Feb. **1956.** 2 figs., 2 refs. **DWB**—The diurnal variation of the collisional frequency of the *F* region, calculated from the absorption of a radio wave passing through it, varies from 10^2/sec at midnight to 5×10^3/sec near noon. The rate of rise increases with cos χ, which is explained by a rapid rise of temperature in the *F* region with the approach of noon. *Subject Heading:* **1. F layer ionization.**—*C.E.P.B.*

7.8–264 551.594.12:551.510.535

King, G. A. M., **Electron distribution in the ionosphere.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(3):184–185, March **1956.** ref., eqs. **DWB**—Addendum to his note (*J. Atmos. and Terr. Phys.*, 5(4):245–246, Sept. 1954; *see* 6.3–368, March 1955, *MAB*) giving a rapid method of calculating height of a given electron density. *Subject Headings:* **1. Electron density 2. Ionosphere. I. Kelso, J. M.**—*C.E.P.B.*

7.8–265 551.594.12:551.510.535

Sheriff, R. M., **A study of the total electron content of the F-region of the ionosphere over Ahmedabad (23°N, 72°38′E), India.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(1/2):91–97, Feb. **1956.** 4 figs., 9 refs., 3 eqs. **DWB**—The total number of electrons in a column of unit cross section up to heights of maximum electron density has been calculated by RATCLIFFE's method for quiet and disturbed days. The diurnal and seasonal variations are shown together with semithickness, height of maximum electron density and height of base of *F* layer, assuming parabolic electron distribution. *Subject Headings:* **1. F layer ionization 2. Ahmedabad, India.**—*C.E.P.B.*

7.8–266 551.594.21

Gunn, Ross, **Initial electrification processes in thunderstorms.** *Journal of Meteorology*, 13(1):21–29, Feb. **1956.** 4 figs., 21 refs., 14 eqs. **DWB**—Active thunderstorms can be produced by clouds above 0°C. Thermal bombardment with ions, normally produced by cosmic

rays or radioactivity, gives droplets in a stable cloud up to 12 elementary charges, about half being charged positively and half negatively. The droplets associate to form raindrops which fall out with an average charge of about 0.04 e.s.u. In clean air the ratio of − to + conductivity is 1.4, so − ions transfer to falling droplets more rapidly than + ions. The drops fall out, leaving a + charged space. This process is discussed quantitatively and it is found "that the differential discharge of highly charged rain falling in such an environment systematically separates + and − electricity and establishes a distribution that accounts for thunderstorms of low to moderate intensity." The analysis also explains volcanic lightning. *Subject Heading:* **1. Thunderstorm electricity.**—*C.E.P.B.*

7.8–267 551.594.221:778.37

Komel'kov, V. S., **Kanal lidernogo razriada.** [Channel of leader discharge.] *Akademiia Nauk SSSR, Doklady*, 58(1):57–60, **1947.** 3 figs., 9 refs. **DLC**—The development of the theory of long arcs or lightning strokes is hampered by the absence of experimental data on the most important parameters of the leader channel, current densities and longitudinal gradients; both, in the leader channel and in front of it (in the zone of ionization). Author presents the results of photographic measurements of the size of the ionization area and change of diameter of the leader channel made with the aid of a slot installed perpendicular to the spark's trajectory. It has been found, among other results, that the ionization area, in contrast to the channel of the leader is characterized by high longitudinal fields in the channels of the streamers. The whole leader process is a peculiar combination and coexistence of arc and streamer discharges, which coincide in some of the characteristics with G. E. Bruce's scheme. *Subject Headings:* **1. Lightning research 2. Lightning photography.**—*A.M.P.*

7.8–268 551.594.222

St. Elmo's fire [in] South China Sea [and at] Madeira. *Marine Observer*, 25(168):95–96, April **1955.** fig. **DLC**—Observation of St. Elmo's fire as white globes 3–4 in. in diameter on board ship 15th May 1954 in South China Sea. On 7th June 1954 a ship approaching Madeira saw a brush-like discharge from the mountain peaks. *Subject Heading:* **1. St. Elmo's fire.**—*C.E.P.B.*

AURORAS

7.8–269 551.594.5:550.385

Heppner, James P. (*Calif. Inst. of Technology, Pasadena*), **Note on the occurrence of world-wide S.S.C.'s during the onset of negative bays at College, Alaska.** *Journal of Geophysical Research*, Wash., D. C., 60(1):29–32, March **1955.** fig., 2 refs. **DWB**—World-wide sudden commencements which appear during the night hours at College, Alaska, are found to occur most frequently during the onset, or decreasing *H* stage, of negative bays. As this stage of magnetic disturbance accompanies a distinct change from homogeneous to rayed aurora, it is suggested that s.s.c.'s have an atmospheric source which is related to sudden changes in auroral activity. *Subject Headings:* **1. Sudden commencements 2. Magnetic disturbances 3. Auroral-magnetic relationships 4. College, Alaska.**—*Author's abstract.*

7.8–270 551.594.5(09)

Seydl, Otto, **Polární záře ve zprávách starých kronikářů.** [Auroras in the records of old chroniclers.] *Meteorologické Zprávy*, Prague, 8(3):66–71, June **1955.** 2 figs. Russian and English summaries p. 66. **DWB**—Eighty descriptions of auroras observed in Bohemia from 1013 to 1805 are quoted from old Czech chronicles. Dates of the observations are included. The author discusses the vocabulary used in describing details of the appearance and movement of auroras. The phenomenon, extremely rare in Bohemia, was usually associated with the idea of fire and blood and was therefore considered to be a foreboding of war and other disaster. *Subject Headings:* **1. Historic auroras 2. Bohemia.**—*G.T.*

7.8–271 551.594.5

Show model aurora. *Science News Letter*, Wash., D. C., 67(20):308, May 14, **1955.** **DLC**—Describes an experimental arrangement developed by Dr. Willard H. Bennett of the Naval Research Laboratory in Washington. A small model earth is bombarded by electrons

inside a vacuum tube. The existence of a ring current as first postulated by CHAPMAN, FERRARO and MARTIN, is demonstrated in this experiment. It also shows simultaneous appearance of auroras in both hemispheres. *Subject Headings:* **1. Auroral models 2. Chapman-Ferraro theory 3. Ring currents.**—*G.T.*

7.8–272 551.594.51:535.33

Bates, D. R. (*Queen's Univ., Belfast, Northern Ireland*), **Theory of the auroral spectrum.** *Annales de Géophysique*, Paris, 11(3):253–278, July/Sept. **1955.** 7 figs., 4 tables, 81 refs., 47 eqs. **DLC**—After summarizing the results of some recent work on collisions between heavy particles, consideration is given to the emission of the Balmer lines of hydrogen and to the possible emission of lines of other elements which may be present in the incident stream causing an aurora. The main luminescence observed is due to (i) inelastic collisions made by the incident particles and by the ejected electrons (which may possess kinetic energy other than that given them initially), (ii) degradation of the ultra-violet radiation emitted and, in the case of sunlit auroras, scattering of solar radiation, (iii) thermal process such as dissociative recombination. These various mechanisms are discussed and estimates are made of the relative importance of some of them. Finally, suggestions are advanced regarding the detailed reactions responsible for the excitation of the different lines and band systems. *Subject Headings:* **1. Auroral energy excitation mechanism 2. Auroral spectrography.**—*Author's abstract.*

7.8–273 551.594.52

Currie, B. W. and Weaver, J. T., **Vertical extent of auroral arcs and bands.** *Canadian Journal of Physics*, Ottawa, 33(11):611–617, Nov. **1955.** 2 figs., 8 refs. **DWB, DLC**—Measurements of the vertical extent of quiet arcs and bands from 181 auroral photographs, taken at Chesterfield (63.3°N, 90.7°W), Coppermine (67.8°N, 115.2°W), and Saskatoon (52.1°N, 106.6°W), indicate that these forms are confined to a narrow layer of the atmosphere immediately above the 100-km level. The most frequent thickness of this layer is between 20 and 40 km. Values in excess of 50 km rarely occur. The percentage of auroral time that the luminosity is restricted to this layer is uncertain. The ratios of the number of arcs and bands to the total number of observed forms suggests a value exceeding 50%. When the occurrence of each form is weighted according to the angular field covered by it, a value as high as 60% is indicated. *Subject Headings:* **1. Auroral heights 2. Canada.**—*Authors' abstract.*

SFERICS AND RADIO METEOROLOGY

7.8–274 551.594.6

Holzer, R. E. and Deal, O. E., **Low audio-frequency electromagnetic signals of natural origin.** *Nature*, London, 177(4507):536–537, March 17, **1956.** 2 figs., 4 refs. **DWB**—Observations of low frequency (25–130 cycles/sec) signals in the remote Borrego Valley of S. California showed a diurnal variation of amplitude in spring and fall very similar to variation of potential gradient at sea. In summer the variation of signal amplitude is larger and different. It is calculated that the mean amplitude is related to thunderstorms in progress over the world. *Subject Heading:* **1. Atmospherics.**—*C.E.P.B.*

7.8–275 551.594.7:551.510.52

Ames, L. A.; Newman, P., and Rogers, T. F. (*all, Air Force Cambridge Res. Center, Mass.*), **VHF tropospheric overwater measurements far beyond the radio horizon.** *Institute of Radio Engineers, N. Y., Proceedings*, 43(10):1369–1373, Oct. **1955.** 6 figs., 13 refs. **DLC**—Using a high-power radar-type transmitter near Boston, Mass., point-to-point measurements have been made at a frequency of 220 mcps on 200- and 400-statute-mile overwater paths extending along the east coast. Comparisons are made with similar data available for overland paths. Correlations between the shorter path field-strength data and sea echo back-scatter near the transmitter site are indicated. Airborne field-strength measurements have also been made out across the North Atlantic Ocean to a distance in excess of 400 miles; the variation of field strength with distance is graphically displayed by this technique. *Subject Headings:* **1. Tropospheric propagation over water 2. Radio wave propagation.**—*Authors' abstract.*

7.8–276 551.594.7:551.510.52:621.39

Bullington, Kenneth (*Bell Telephone Labs., N. Y.*), **Characteristics of beyond-the-horizo radio transmission.** *Institute of Radio Engineers, N. Y., Proceedings,* 43(10):1175–118 Oct. **1955.** 5 figs., 35 refs. **DLC**—This paper summarizes the principal characteristics c tropospheric transmission beyond the horizon and compares them with some of the propertie of ionospheric scatter transmission. Quantitative results are given on the dependence c the average signal level on distance and frequency, fading phenomena, band-width capabilitie and realizable antenna gain. A short historical summary of beyond-horizon tropospheri transmission is also included. *Subject Headings:* **1. Tropospheric propagation 2. Radi transmission.**—*Author's abstract.*

7.8–277 551.594.7:621.39

Bullington, K.; Inkster, W. J., and Durkee, A. L., **Results of propagation tests at 505 m and 4,090 mc on beyond-horizon paths.** *Institute of Radio Engineers, N. Y., Proceedings* 43(10):1306–1316, Oct. **1955.** 18 figs., 3 tables, 2 refs. **DLC**—This paper gives the results of some radio propagation tests which were made on two beyond-horizon paths in Newfound land. During these tests simultaneous transmissions at 505 mc and 4,090 mc over a 150 nautical mi path were measured for a full year, and transmission at 505 mc over a 255 m path was measured for a period of 5 months. Both of these paths were partly over land anc partly over water. Long term median signal levels and fading statistics for the two paths are given, as well as the results of some measurements of the improvement obtained from space diversity reception and the gain realized from large (28 ft) antennas on the 150 mi path. The test results provide further evidence of the feasibility of using uhf beyond-horizon links in communication systems. *Subject Headings:* **1. Radio wave propagation 2. Radio fading 3. Newfoundland.**—*Authors' abstract.*

7.8–278 621.396:551.594.7

Huxley, L. G. H., **The interpretation of measurements of radio-wave interaction.** *Journal of Atmospheric and Terrestrial Physics,* London, 8(1/2):118–120, Feb. **1956.** 7 refs., 6 eqs. **DWB**—The original theory of interaction of radio waves is modified to take account of the molecular concentration instead of the collisional frequency. *Subject Heading:* **1. Radio wave interaction.**—*C.E.P.B.*

7.8–279 551.594.7:551.510.535

Parkinson, R. W., **The fading periods of the *E*-region coupling echo at 150 kc/s.** *Journal of Atmospheric and Terrestrial Physics,* London, 8(3):158–162, March **1956.** 3 figs., 11 refs. **DWB**—Fading periods of coupling echoes are discussed. Short-period fades (period of about 1–2 min) are superposed on long-period fades (5–10 min upward). The long fades are attributed to a diffracting screen at 90 km and the short fades to a screen below this level, but an alternative explanation is a single screen at coupling level. *Subject Headings:* **1. E layer 2. Radio fading.**—*C.E.P.B.*

ACOUSTICAL PHENOMENA

7.8–280 551.557:551.524.7:551.596.1:551.507.362

Groves, G. V., **Introductory theory for upper atmosphere wind and sonic velocity determination by sound propagation.** *Journal of Atmospheric and Terrestrial Physics,* London, 8(1/2):24–38, Feb. **1956.** 6 figs., 9 refs., 71 eqs. **DWB**—Expressions for use with the rocket-grenade experiment are developed for finding the mean values of the horizontal wind components and of the velocity of sound for a sound-ray travelling between two points. From data of the Upper Atmosphere Rocket Research Panel the mean velocity of sound is calculated up to 90 km. It is shown that for a nearly vertical ray received at the ground the contributions of second-order terms are less than 0.8 m/s, and for rays of any inclination generally less than 8 m/s. *Subject Headings:* **1. Upper air wind measurement 2. Upper air temperature measurement 3. Sound waves 4. Rocket grenades.**—*C.E.P.B*

PART II. A SELECTIVE ANNOTATED BIBLIOGRAPHY ON THE MICROMETEOROLOGY OF SNOW COVER (SUPPLEMENT)

By: *Geza Thuronyi, N. T. Zikeev* and *Malcolm Rigby*

INTRODUCTORY NOTE

This supplement contains material (including some of the basic works) which, for some reason (space and time limitations, unavailability, etc.) was left out of the main bibliography published in the July issue of Meteorological Abstracts and Bibliography. The subject matter is the same as in the July bibliography, but a larger proportion of papers dealing with forest influences on snow cover has been included in the supplement.

Naturally this presentation of additional references does not represent a complete treatment of the subject of snow cover physics. Our purpose is merely to fill out a few gaps in the cross section of specific aspects of snow cover which we tried to cover in the previous bibliography (see introduction to the July bibliography).

The subject outline which follows refers only to the material in this supplementary part of the bibliography. To facilitate joint use with the July bibliography, an arrangement similar to that of the principal outline has been used.

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1889–1895

7H–1 551.578.46

*Voeĭkov, A., **Der Einfluss einer Schneedecke auf Boden, Klima und Wetter.** [Influence of snow cover on soil, climate and weather.] *Geographische Abhandlungen*, Vienna, 3(3), **1889.** 115 p. tables, foot-refs. Also: [**Review**] by Brückner, E. in *Meteorologische Zeitschrift*, 6(9): [65]–[68], Sept. **1889.** Also: Voeĭkov, A., **Verdunstung einer Schneedecke.** [Evaporation of a snow cover.] *Ibid.*, 7(1):38–39, Jan. **1890.** Also: Brückner, E., **Verdunstung einer Schneedecke.** *Ibid.*, 7(4): 150–152, April **1890. DWB**—In this much-quoted basic monograph, the physical properties of a snow cover and their environmental effects are examined in the light of data collected by the author or reported by other writers. The subject is treated in nine chapters as follows: 1) Snow temperature and its effect on soil temperature (thermal conductivity of snow; comparative measurements of soil temperature with and without snow cover). 2) Effect of a snow cover on air temperature under various conditions of general circulation, cloudiness, etc. 3) Fourteen years of observation of snow cover duration at Uppsala. 4) Effect of snow cover on nonfreezing temperatures; mechanism of snow melt (cooling of a warm wind over a snow surface; effect of snow free areas upon melt; different melting processes in high and in low latitudes; effect of snow melt upon mean temperature, etc.). 5) Effect of snow cover on mean temperature in winter (comparison of snow conditions and climatic characteristics of different regions in Russia). 6) Snow melt, snow cover thickness, density and duration. 7) Snow cover in high mountains (effect of local weather and climate; variability of distribution; water storage and regulation of water supply by glaciers). 8) Effect of a snow cover on atmospheric pressure, humidity and wind. 9) Conclusions and suggestions. The effects of snow cover on the surroundings are explained by its poor thermal conductivity, its temperature limitation by the melting point, the roughness of its surface (especially affecting wind), its evaporation and its melting. In the three articles in **Meteorologische Zeitschrift,** VOEĬKOV's statement that "because of evaporation of snow the relative humidity over snow is larger than without snow" is rejected by BRÜCKNER and maintained by VOEĬKOV, both authors presenting data in support of their argument. *Subject Heading:* **1. Snow cover effects on climate.** —*G.T.*

7H–2 551.578.46:551.582(494,433)

*Brückner, Eduard, **Ueber den Einfluss der Schneedecke auf das Klima der Alpen.** [Effect of snow cover on the climate of the Alps.] *Deutscher und Oesterreichischer Alpenverein, Zeitschrift*, 24:21–51, **1893.** tables, refs. **DLC**—Properties of snow cover affecting air temperature are discussed and summed up as follows: 1) snow can never warm up above the melting point; 2) the snow surface reflects a considerable amount of solar radiation; 3) it emits a great deal of radiation; 4) the

thermal conductivity of a snow cover is very low; 5) reflectivity and emissivity are largest in fresh snow, conductivity is larger in compacted snow. Snow and air temperature measurements made at Davos (1891/92) and in the Bavarian Alps (1888/89 and 1890/91) are reported. The data presented include: snow and air temperatures with different amounts of cloudiness; comparative snow and air temperatures with and without wind; dew point compared to snow temperature; frequency of snow evaporation, etc. The values tabulated appear to substantiate the author's thesis that a snow cover considerably lowers the temperature of the atmosphere. *Subject Headings:* **1. Snow cover effects on climate 2. Climate of the Alps 3. Davos, Switzerland 4. Bavarian Alps.**—*G.T.*

7H–3 551.578.46:551.524 551.578.46:551.571

Süring, R., **Temperatur- und Feuchtigkeitsbeobachtungen über und auf der Schneedecke des Brockengipfels.** [Temperature and humidity observations above and on the snow cover on Brocken peak.] *Meteorologische Zeitschrift*, 12(2):54–61, Feb. **1895.** tables, refs. **DLC**—In the measurements made on Brocken Mountain (1142 m) in the winter of 1893/4, humidity was measured for the first time immediately above a snow cover, along with temperature above and in the snow cover. Frequencies of the various specified values obtained are reported for a shielded and an open location. The results are summed up as follows: 1) protection from wind considerably affects snow surface temperature readings; 2) air-snow temperature difference increases with increasing air temperature and decreasing cloudiness; 3) in the presence of fog and snowfall the snow surface is usually warmer than the air (quicker cooling of air). Absolute and relative humidity is usually larger in the immediate vicinity of snow. Conditions on Brocken Mountain favor evaporation of the snow cover much more than condensation, both on clear and cloudy days. *Subject Headings:* **1. Snow cover effects on air temperature 2. Snow cover effects on humidity 3. Brocken Peak, Harz Mts.**—*G.T.*

1901

7H–4 551.578.46:551.588.6

Tol'skiĭ, A., **K voprosu o snezhnom pokrove v lesu i na pole.** [On problem of snow cover distribution in forest and in field.] *Meteorologicheskiĭ Vestnik*, Leningrad, 13(5):144–149, **1903.** tables. **DWB**—The study of snow cover distribution carried out near Staraya Russa showed large differences in depth and density. In an open field, under influence of wind compacting power, density of fresh snow after snow storm reached 0.4–0.5. Mean density during winter in field was 0.30 and in forest, 0.26. Snow cover in forest was deeper and took longer to melt. Duration of snow cover in field in winter 1901–1902 was 158 days. Snow covered the soil in forest for 176–179 days. Settling of snow cover during melting period was on the average 3.6–4.1 cm per day, and in forest was 1.4–2.5 cm per day. *Subject Headings:* **1. Forest influences on snow cover 2. Snow cover distribution 3. Staraya Russa, U.S.S.R.**—*N.T.Z.*

1911–1917

7H–5 551.578.46:58

Kozlovskiĭ, G. N., **Nuzhno li zaderzhivat' sneg na nashikh poliakh.** [Is it necessary to retain snow on our fields?] *Vestnik Sel'skogo Khoziaĭstva*, Moscow, 12(46):5–6, Nov. 13, **1911.** table. **DLC**—Influence of the state of soil surface on depth of snow cover was studied in Bessarabia Province. Larger differences were observed when strong winds occurred with low air temperatures. Uneven and scant snow cover was observed over plowed fields, even distribution and thicker cover over weed covered fields. Corn stubble provided far better snow accumulation. Depth of snow cover varied from 7–9 cm on fallow land to 22–40 cm on field with corn stubble. *Subject Headings:* **1. Snow drift prevention 2. Snow retention 3. Vegetation effects on snow cover depth 4. Bessarabia, U.S.S.R.**—*N.T.Z.*

7H–6 551.578.46:551.588.6

Church, J. E., Jr., (*Mt. Rose Obs., Nevada*), **The conservation of snow; its dependence on forests and mountains.** *Scientific American Supplement*, New York, 74(1914):152–155, Sept. 7, **1912.** photos, diagr. **DLC**—A snow sampler with spring-balance weigher, developed by the author, is described in detail and illustrated. Sample data from the snow surveys conducted on Mt. Rose (Sierra Nevada) from 1909 to 1912 are given, making it evident that timber is extremely effective in retaining snow. This effect is also apparent from the photographs presented. *Subject Headings:* **1. Snow retention 2. Forest influences on snow cover 3. Mt. Rose, Nevada.**—*G.T.*

7H–7 551.579.2:551.524

Johansson, O. V., **Dämpfende Wirkungen des Schnees und Eises auf die Lufttemperatur.** [Moderating effect of snow and ice on atmospheric temperature.] *Finska Vetenskaps-Societeten, Helsinki, Ofversigt af Forhandlingar, Ser. A*, 55(11):27–64, **1912/13.** tables, foot-refs. **DLC**—

Climatic data from all over Europe, especially from Finland (also some from Asia) are examined. Frequencies of the occurrence of specified temperature values are analyzed in respect to a possible effect of cooling by snow melt. The data are found to support the assumption that snow melt lowers maximum temperatures, increases the frequency of near-freezing temperatures and makes temperature less variable. *Subject Heading:* **1. Snow melt effects on air temperature.**—*G.T.*

7H–8 551.508.77:551.578.46 551.578.46:551.588.6

Church, James E., **Recent studies of snow in the United States.** *Royal Meteorological Society Quarterly Journal*, 40(169):43–52, Jan. **1914.** 6 figs., tables. **DLC**—A new snow sampler and spring balance weigher used in Nevada, and two other types used in the U. S. are described. Studies of the density of the snow in relation to elevation and exposure to wind; the water equivalent, relation of mountains and forests to evolution of a snow cover; temperature of snow in shade and sun; evaporation of snow; comparison of bare and forested mountain tops (10,800 ft) are reported. Studies were made for the most part at base of Mt. Rose, Nevada in 1910–12. Treeless meadows at Tahoe City (6220 ft) in 1910 showed maximum storage in Jan., the open forest of pine and fir showed the maximum at the height of the snow season (March 11), and the more dense fir forest the maximum at the end of the season (25% of peak amount) when the open meadow was bare and the pine and fir forest retained only 1/20 of peak amount. *Subject Headings:* **1. Snow sampling methods 2. Snow retention 3. Forest influences on snow cover 4. Nevada.**—*M.R.*

7H–9 551.579.2:551.524.3

Schmidt, Wilhelm, **Der Einfluss der Schmelzwärme im wiener Klima.** [The effect of melt heat on the climate of Vienna.] *Meteorologische Zeitschrift*, 33(10):438–446, Oct. **1916.** foot-refs. **DWB**—This abridged version of paper published earlier as **Der Einfluss der Schmelzwärme auf das Klima von Wien** in *Akademie der Wissenschaften, Vienna, Math. Naturwiss. Klasse, Abt. IIa, Sitzungsberichte*, 124:517–566, **1915,** includes the author's general reasoning, omitting the extensive numerical calculations. It is shown that a quantitative appraisal of the effect of melt heat on climate can be obtained from the frequency distribution of vapor pressure amounts. Such a calculation is made for Vienna (data for 1890–1909). Also derived is a theoretical annual temperature development which would take place if the direct effect of melt heat were eliminated. *Subject Headings:* **1. Melt heat effect on climate 2. Climate of Vienna 3. Vienna, Austria.**—*Trans. of author's abstract.*

7H–10 551.573:551.578.46

Baker, F. S., **Some field experiments on evaporation from snow surfaces.** *Monthly Weather Review*, 45:363–366, **1917.** 2 figs., table, 3 refs., eq. **DWB**—Investigation of amount of evaporation from snow surfaces undertaken at Utah Experiment Station winter 1915–1916. Method described. Diurnal and nocturnal evaporation determined separately. Wind and temperature conditions also recorded. Total evaporation for winter computed. Effect of forests considered. (*Same item as* K–4, Nov. 1950, *MAB.*) *Subject Headings:* **1. Evaporation of snow 2. Utah.**—*H. P. Kramer.*

1921–1930

7H–11 551.578.46:551.573/4

Brückner, E., **Verdunstung und Kondensation am Schnee und Eis im Gebirge.** [Evaporation and condensation on snow and ice in the mountains.] *Zeitschrift für Gletscherkunde*, Leipzig, 12(1/2):79–82, June **1921.** 4 refs. **DLC**—Reviews work of Dufour and Forel (see 7G–21, July 1956, *MAB.*) and of Billwiller and concludes that on snow surfaces evaporation is more significant generally than condensation. The latter usually prevails in depressions in high locations. The theory that condensation is a significant source of glacial alimentation applies to glacier tongues only. *Subject Headings:* **1. Evaporation of snow 2. Condensation on snow 3. Glacier nourishment.**—*G.T.*

7H–12 551.578.46:551.524

Sverdrup, H. U., **Maudekspeditionens videnskabelige arbeide 1918–19 og nogen av dets resultater.** [The "Maud" expedition's scientific work in 1918–19 and some of its results.] *Naturen*, 46:5–32; 65–88, **1922.** 11 figs., tables. **DLC**—Astronomical, meteorological, tidal and geomagnetic results obtained during the "Maud" Expedition are briefly reported, including snow and ice temperatures. A graph showing temperature variations from Dec. 21, 1918 to Jan. 3, 1919 in the air above snow, at the snow surface and at 50, 80 and 130 cm below the surface is presented and discussed. Snow temperature closely followed air temperature which varied between −32 and −42½°C. Snow temperature at 50 cm below the surface was −15 to −20°C, at 80 cm it was −10 to −12°C and at 130 cm (i.e. at the boundary between snow and ice)) −4 to −6°C. *Subject Headings:* **1. Snow temperature data 2. "Maud" Expedition, 1918–1925 3. Arctic.**—*G.T.*

7H–13 551.578.46:551.525.5

*Mosolov, V. P., **Razmerzanie pochvy i ispol'zovanie snegovoĭ vody.** [Thawing of soil and snow melt utilization.] *Nauchno-Agronomicheskiĭ Zhurnal*, Moscow, 2:681–699, **1925.** 2 figs., 6 tables, 3 refs. Also his: **K izucheniiu voprosa o promerzaniĭ pochvy.** [Study of soil freezing.] *Ibid.*, 2(12):758–775, **1925.** 3 figs., 10 tables. Also his: **K voprosu o gibeli ozimykh kul'tur.** [On the problem of destruction of winter crops.] *Ibid.*, 3:669–723, **1926.** 2 figs., 6 maps, 16 tables. **DLC**—Investigations carried out at the Experimental Station of the Agricultural Academy near Moscow for 15 years showed close dependence of soil thawing and freezing on depth and density of snow cover and on vegetation. Spring thawing of soil under deep and dense cover began earlier. Snow cover influence was greater on cultivated soil. Soil freezing in clover field was 20 cm without snow cover and 8 cm with snow cover. In a field of winter crops it was 16 cm and 9 cm, and in deeply cultivated soil 33 cm and 16 cm. Influence of meteorological factors (air and soil temperature, snow depth, glaze) on destruction of winter crops is analyzed. Data of 25 year period of snow cover depth are presented for 12 provinces of the U.S.S.R. *Subject Headings:* **1. Snow cover effects on soil freezing 2. Soil thawing 3. Moscow, U.S.S.R.**—*N.T.Z.*

7H–14 551.521.32:551.578.46

Richter, Karl, **Über den Einfluss des Durchdringungsvermögens der Sonnenstrahlen durch Schnee auf das arktische Pflanzenleben.** [The influence of solar radiation penetration through snow on Arctic plant life.] *Naturwissenschaften*, 14:501–503, May 28, **1926.** 3 figs., tables. **DLC**—Solar radiation penetration into snow cover through horizontal and vertical surfaces and through a surface inclined at a 30° angle was measured on April 8, 9 and 13, 1924 at Cape Philip Broke, 74½°N, 18½°W. The length of the path of solar radiation through snow is found to increase with increasing angle of incidence (as illustrated graphically). Thus radiation may, under certain circumstances, penetrate into the snow cover considerably deeper than assumed previously, but not deep enough to affect plant life to any great extent, as a cover 35 cm deep will absorb all the solar heat radiation, and a thinner cover only occurs during the last 4 or 5 days of the melt period. *Subject Headings:* **1. Radiation penetration in snow 2. Snow cover effects on ecology 3. Cape Philip Broke.**—*G.T.*

7H–15 551.508.21:551.525.5

Kalitin, N. N., **Rol' aktinometrii v razreshenii problemy vechnoĭ merzloty.** [Role of actinometry in the solution of the permafrost problem.] *Akademiia Nauk SSSR. Komissiia po Izucheniiu Estestvennykh Proizvoditel'nykh Sil Soiuza, Materialy*, No. 80:157–176, **1930.** 12 figs., tables, foot-refs., 4 eqs. **DLC**—A number of instruments used for measuring the radiation of the sun, sky and earth are described in detail and illustrated. The use of theoretical knowledge of the radiation balance to supplement the meager data available for the permafrost regions of the Arctic is stressed. A station to measure these elements is recommended for Iakutsk, where some systematic data has been obtained since 1929. Values of various types of radiation, albedo of various surfaces including snow, and spectral, latitudinal and cloud-produced variations are presented in tables and graphs and analyzed. *Subject Headings:* **1. Radiation balance over permafrost 2. Radiation in Arctic 3. Yakutsk, U.S.S.R.**—*M.R.*

1931

7H–16 551.578.46:551.521

*Kalitin, N. N., **Opyt izucheniia radiatsionnykh svoĭstv snegovogo pokrova.** [Radiation properties of a snow cover.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Izvestiia*, No. 1/2:9–18, **1931.** 4 figs., 5 tables, refs. English summary p. 18. Also German version as: **Die Strahlungseigenschaften der Schneedecke.** *Beitrage zur Geophysik*, 34:354–366, **1931.** 6 figs., 4 tables. **DLC**—Radiation penetration into a snow cover was measured in Slutsk near Leningrad (winter 1930/31) by means of a pyranometer buried under the snow and a second one placed on the snow surface. The installation of instruments is shown in photographs. Detailed tables contain the measured values of cloudiness, solar angle, albedo of the snow surface, thickness of snow cover, radiation received and absorbed at the snow surface, radiation passing through the cover, snow surface temperature, air temperature and state of snow. Radiation penetration into snow is also graphically represented. Radiant energy penetration through a snow cover 5 cm thick is found to be 8% of the radiation received and 40% of the radiation absorbed by the snow surface. For a 10 cm cover the penetration is 2.4% and 20%. *Subject Headings:* **1. Radiation penetration in snow 2. Pyranometers 3. Albedo of snow 4. Slutsk, U.S.S.R.**—*G.T.*

7H–17 551.524.31:551.578.46

Sverdrup, Harald U., **Diurnal variations of temperature at polar stations in the spring.** *Beiträge zur Geophysik*, Leipzig, 32:1–14, **1931.** 2 figs., 4 tables, 4 refs. German summary p. 1. **DLC**—

Relations between radiation income, thickness of the cold atmospheric surface layer over snow diurnal air temperature variation, and snow surface temperature are analyzed in data selected fro the "Maud" observations (1918–1925). The cold atmospheric ground layer which forms during t polar night by surface cooling, is found to undergo a convective increase in thickness after the su returns. The amplitude of diurnal temperature variation is directly proportional to the amplitud of radiation income and inversely proportional to the thickness of the cold convection layer. *Subje Headings:* **1. Temperature over snow surface 2. Snow cover effects on temperature variation 3. "Maud" Expedition, 1918–1925 4. Arctic.**—*G.T.*

1932

7H–18 551.578.46:551.593.1

Chirvinskiĭ, P. N., **Iskristost' snega.** [The scintillation of snow.] *Klimat i Pogoda*, 8(11/12) 181–184, **1932.** 2 figs., tables. **DWB**—The scintillation of snow cover as a special phenomeno dependent on the physical properties of the snow is described and results of observations are given The phenomenon was measured in gleams per sq.m. of snow surface by an observer located opposit the sun (Peniug-Ust'-Ukht region, Feb./March 1932). The number of brilliant or irridescent gleam varied with the structure of the snow cover, being more intense on the surface of fluffy snow tha on a compacted surface. The intensity of the phenomenon decreased with the presence of rime an was least on an ice crust. *Subject Headings:* **1. Snow scintillation 2. Reflective properties of snow 3. Peniug-Ust'-Ukht region, U.S.S.R.**—*S.I.P.R.E. abstract.*

7H–19 551.578.4

*Koloskov, P. I., **Klimaticheskiĭ ocherk poluostrova Kamchatki.** [Climatological sketch of the Kamchatka Peninsula.] *Vladivostok. Dal'nevostochnyĭ Geofizicheskiĭ Institut, Izvestiia*, 2(9) 119–145, **1932.** fig., 13 maps, 14 tables. **DLC**—Climatic data for 9 stations derived from observa tions made for the period 1908–1925 are presented. The snow cover was up to 3 m deep at Petro pavlovsk. Thermal differences between snow surface and the depth of 0.25 m in soil averaged 11.5°C. In Tigil, where the depth of snow cover was insignificant, these differences were 4–5° only *Subject Headings:* **1. Climatic data 2. Snow cover data 3. Thermal properties of snow cover 4. Kamchatka, U.S.S.R.**—*N.T.Z.*

1933

7H–20 551.578.46:551.311.182

Artamonov, D. S., **Deĭstvie ledianogo pokrova na rekakh Volzhskogo basseĭna.** [Ice cover in rivers on the Volga basin.] *Sbornik po Ledotekhnike*, 1:97–164, **1933.** figs., map, tables. **DLC**— The influence of snow cover on ice formation in the Volga basin is outlined. Observation data since 1877 were used. *Subject Headings:* **1. Snow cover effects on river ice 2. Ice formation 3. Volga Basin.**—*N.T.Z.*

7H–21 551.578.46:551.511

Niederdorfer, Erich, **Messungen des Wärmeumsatzes über schneebedecktem Boden.** [Measurements of heat exchange over snow covered ground.] *Meteorologische Zeitschrift*, Brunswick, 50(6):201–208, June **1933.** 2 figs., 2 tables, foot-refs. **DLC**—Temperatures in the surface layer of a snow cover (to 10 cm) were measured at night in Jan. 1932 (Eisenkappel, Austria). It appears that considerable pseudo-conduction from air to snow (0.03 to 0.04 cal/cm²) took place when the air at 1 m was 4 to 5°C warmer than the snow surface, with wind speeds not exceeding 0.5 m/sec. The relative contribution of advection and of turbulent exchange to this heat transfer is discussed. Data on diurnal variations of heat exchange in and above the snow cover are graphically presented. Thermal conductivity is determined as 0.0004 to 0.0006 cal/cm. sec. for old frozen snow, 0.0008 to 0.0009 for wet snow and 0.0003 for fresh snow at −10°C (for this latter type only a single measurement is available). *Subject Headings:* **1. Heat exchange over snow 2. Thermal conductivity of snow 3. Eisenkappel, Austria.**—*G.T.*

7H–22 551.578.46:551.506.5(268)

*Sverdrup, Harald Ulrik, **Meteorology, Part I, Discussion.** (In: Maud Expedition, 1918–1925, **The Norwegian North Polar Expedition with the "Maud," 1918–1925, Scientific Results.** Bergen, John Grieg, 1927–1939. 5 v.) v. 2, **1933.** 331 p. 110 figs., 149 tables, 6 plates, bibliog. p. 329–331. **DWB**—In this analysis of meteorological data collected during the "Maud" Expedition (the basic data have been published in vol. 3) several aspects of the meteorological effect of a snow cover are discussed. In the chapter on upper air observations the effect of radiational heating of air over snow on the structure of the lowest atmospheric layer is brought to attention. The chapter on temperature data includes an analysis of differences between snow surface temperature and air temperature at 80 cm with different values of temperature and cloudiness (hourly values of the

temperature difference between snow surface and the air at 80 cm are tabulated and discussed); albedo of the snow surface and its relation to radiation income and heat exchange between snow and atmosphere (a value of approximately 76 is found for snow albedo in spring); description of snow melt on the coast, caused by warm wind and heat released by condensation of water vapor; and relations between the diurnal variation of air temperature, radiation income, snow surface temperature and thickness of the convection layer (tabular and graphical presentations). (For fuller abstract, *see* 5I–47, Sept. 1954, *MAB.*) *Subject Headings:* **1. "Maud" Expedition, 1918–25 2. Expeditionary climatic data 3. Snow cover effects on weather 4. Arctic.**—*G.T.*

1934

7H–23 551.578.46:551.573

Church, James E., **Evaporation at high altitudes and latitudes.** *American Geophysical Union, Transactions,* 15(2):326–351, June **1934.** 15 tables. **DLC**—Evaporation of snow was studied on Mount Rose and in the Lake Tahoe basin (1910–1917) and in Greenland (1926–1929), by means of pans buried in snow. The evaporation rates obtained are tabulated, discussed in connection with various climatic features and compared with evaporation values in other localities. *Subject Headings:* **1. Evaporation of snow at high altitudes 2. Sierra Nevada 3. Greenland.**—*G.T.*

7H–24 551.578.46:551.556.2

*Leont'evskiĭ, Nikolay Petrovich, **Rol' drevesnykh zashchitnykh polos v povyshenii urozhaĭnosti.** [Importance of forest shelter belts for increase of crop yield.] *Zhurnal Geofiziki,* Moscow, 4:128–140, **1934.** 7 figs., 11 tables, 5 refs. German summary p. 139–140. **DLC**—Shelter belts prevented snow drifts and effected a more evenly distributed snow cover between the tree strips in the Kamennaia Step' region. Measurements of snow cover depth and density showed that when the snow was 15 cm deep in open steppe, it was up to 22 cm in forest region and reached 89 cm in front of shelter belts. Distribution of snow cover, prevailing wind direction, soil temperature, evaporation and soil moisture conditions are illustrated by graphs and tables for shelterbelts and adjacent places. *Subject Headings:* **1. Snow retention 2. Forest shelter belt effects 3. Snow cover effects on crop yield 3. Kamennaia Step', U.S.S.R.**—*N.T.Z.*

1935

7H–25 551.586:581.54:634.9

Steiner, Maximilian, **Winterliches Bioklima und Wasserhaushalt der Pflanzen an der alpinen Baumgrenze.** [Winter bioclimate and water economy of plants at the Alpine tree line.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter,* 2:57–65, **1935.** tables, 16 refs. **DWB**—Among the factors affecting transpiration of plant organs, wind speed, air temperature and evaporative power, and their modification by snow cover are discussed. The drag effect of snow cover on wind is small. Minimum air temperatures on clear nights occur at the snow surface, the temperature difference between 0 and 5 cm being almost as large as between 5 and 150 cm above the snow surface. On clear days the highest temperature occurs at the snow surface on cold days and at 5 cm above the surface on warm days (the snow surface temperature being limited by the melting point). On cloudy days no such thermal stratification of air above snow can be observed. Evaporation rate was found to be lowest in the surface layer. *Subject Headings:* **1. Snow cover effects on microclimatology 2. Tree line 3. Bioclimatology.**—*G.T.*

1936

7H–26 551.521.14:551.578.46:551.521.32

Chernigovskii, N. T., **Neskol'ko opytov nad radiatsionnymi svoĭstvami snega i l'da Karskogo moria u o-va Uedineniia v 1935 g.** [Some experiments on the radiation properties of the snow cover and the ice of the Kara Sea carried out at Uedineniia Island in 1935.] *Arctica,* Leningrad, 4:137–142, **1936.** photo., 2 tables, foot-refs. **DLC**—Observations were made 100 m from the shore of Uedineniia Is. (77°30′24″N, 82°12′12″E) from March 31 to July 7, 1935, to determine the albedo of snow 15–20 cm thick which covered the ice during this period. It was not possible to have a completely overcast sky when measurements were made. Average albedo varied from 89% on April 4 to 58% on July 7 (wet dirty snow). Single observations varied from 94% in April to 52% in July. Penetration measurements showed 10% at 5 cm depth (March 21) when sun was 7°–11° height and albedo 87%. On June 24 with sun 19°–30° height, and albedo 64%, 23–30% penetrated 10 cm of snow. The amount of radiation retained is also given. It is stated that absorption in the upper layers of sea ice increases as the ice decomposes, thus increasing the rate of melting. *Subject Headings:* **1. Albedo of snow 2. Radiation penetration in snow 3. Uedineniia Island.**—*M.R.*

7H–27 551.521.14:551.578.46:551.521.3

Kalitin, N. N., **O velichinakh rasseiannoĭ radiatsii atmosfery v Arktike.** [Amount of diffuse atmospheric radiation in the Arctic.] *Arctica*, 4:121–135, **1936.** 6 figs., 2 tables, foot-refs. English summary p. 135. **DLC**—Diffuse radiation is high in the Arctic because of the great cloudiness and high albedo of the constant snow cover—hence very little radiation is retained at the surface. Values of diffuse radiation under varying cloud cover at 6 Arctic stations are tabulated (observations were made from 1932–1935). These values are higher than any recorded in more southerly latitudes. At Mastyr at the mouth of the Lena, 523 cal./sq.cm of diffuse radiation was received on May 21, 1933 and 541 on May 22. *Subject Headings:* **1. Albedo of snow 2. Albedo effects on diffuse radiation 3. Diffuse radiation in Arctic 4. Mastyr, Siberia 5. Soviet Arctic.**—*M.R.*

1937

7H–28 551.578.4:615.83

Croxton, W. C.; Thurman, W. B. and Shiffer, Theodore, **The penetration of light through snow and ice cover.** *Minnesota Academy of Science, Proceedings*, 5:50–53, April 17, **1937.** 4 tables. **DLC**—Experimental measurements of light penetration into snow and ice are reported and results are tabulated. The tables show: 1) penetration of light into snow cover, 2) variation in penetration with intensity of illumination and 3) with condition of the snow cover, 4) light penetration through ice. Complete extinction of light is found to take place at 8 in. of snow. The fraction of light penetrating a snow cover appears to be less at low levels of incident illumination than at high levels. *Subject Heading:* **1. Light penetration in snow.**—*G.T.*

7H–29 551.593.7:551.575.1

*†Tokmachev, S. M., **Poliarimetricheskaia kharakteristika tumanoobrazuiushcheĭ sredy.** [Polarimetric characteristics of fog forming media.] *Leningrad. Institut Eksperimental'noĭ Meteorologii, Trudy*, 1:5–47, **1937.** 12 figs., 23 tables, 37 refs. **DLC**—Spectral data obtained at Leningrad Forestry Institute during March and April 1934 showing relation of polarization to weather condition. Snow cover decreases polarization from 71–76% to 55–57% and the coefficient of reflectivity of snow cover is 78% compared with snow-free surface of 7–31%, depending on cover. Data on the polarization of light under varying weather and cloud or soil cover conditions and in the several spectra regions (white, red, yellow and blue) and with different sun's height were analyzed for Leningrad Forestry Institute. *Subject Headings:* **1. Snow cover effects on polarization 2. Polarization data 3. Leningrad.**—*M.R.*

1938

7H–30 551.578.46:551.593.7

Nichkevich, O., **Solnechnaia radiatsiia i poliarizatsiia nebesnogo svoda.** [Solar radiation and polarization of skylight.] *Meteorologiia i Gidrologiia*, 4(7):3–13, July **1938.** 2 figs., 6 tables, 9 refs. French summary p. 13. **DWB**—In winter, at Kiev, the coefficient of polarization of sunlight is lower for a given sun angle than in summer or autumn. This is attributed to the effect of snow cover. Data on the average and the diurnal regime of solar radiation (1928–35), and of transparency, ultraviolet radiation received, and coefficient of polarization for various solar heights are given in tables and graphs and discussed. *Subject Headings:* **1. Snow cover effects on polarization 2. Atmospheric transparency data 3. Kiev, U.S.S.R.**—*M.R.*

7H–31 551.578.46:551.524

†*Nyberg, Alf, **Temperature measurements in an air layer very close to a snow surface.** *Geografiska Annaler*, Stockholm, 20(3/4):234–275, **1938.** 9 figs., 11 tables, 27 refs. **DLC**—Temperatures within the first 2½ cm above the snow surface (and at 140 cm) were measured at millimeter intervals with a resistance thermometer (Uppsala Univ., Met. Inst.). The instrument, measurement technique and accuracy are discussed in detail. All data obtained (Jan.–April 1936 and 1937) are tabulated and analyzed as to effect of cloudiness, eddy conductivity, radiative conductivity, wind force and snow melt. Under stable conditions temperature near the ground is found to follow an exponential law with the exponent growing linearly with height. Radiative conductivity very close to the ground does not compare in magnitude to eddy and molecular conductivity. *Subject Headings:* **1. Temperature over snow surface 2. Uppsala, Sweden.**—*G.T.*

7H–32 551.578.46:551.525

Spaeth, J. N. and Diebold, C. H., **Some interrelationships between soil characteristics, water tables, soil temperature and snow cover in the forest and adjacent areas in South-Central New York.** *Cornell Univ. Agricultural Experimental Station, Memoirs*, No. 213, June **1938.** 76 p. 14 figs., 34 tables, 30 refs. **DLC**—Measurements of soil temperature to a depth of 30 in. during two winters (1934–35 and 1935–36) indicated that snow cover 7 in. deep cannot protect field soil from freezing

to a depth of 30 in. Snow cover is deeper in forest zone, where snow melt period is also longer. *Subject Headings:* **1. Snow cover effects on soil temperatures 2. Forest influences on snow cover 3. New York.**—*N.T.Z.*

1939

7H–33 551.521.14:551.578.46

Kuz'min, P. P., **Radiatsiia otrazhennaia ot poverkhnosti moria i pogloshchennaia sloiami vody razlichnoĭ glubiny.** [Radiation reflected from the sea surface and absorbed by water layers at various depths.] *Meteorologiia i Gidrologiia*, 5(7):3–11, **1939.** illus., tables. **DLC**—Values of sea-ice and snow albedo obtained in Kandalaksha Bay, White Sea (1937 and 1938) are tabulated, with specification of type of surface, time of day, height of the sun and amount of radiation. Albedo amounts between 30% for dirty thawing snow and 95% for pure snow were obtained. *Subject Headings:* **1. Albedo of snow 2. Albedo of ice 3. Kandalaksha Bay, White Sea.**—*G.T.*

1940

7H–34 551.578.46:551.511

*Albrecht, F., **Untersuchungen über den Wärmehaushalt der Erdoberfläche in verschiedenen Klimagebieten.** [Investigation of the heat economy of the earth's surface in various climatic regions.] *Germany. Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 8(2), **1940** 80 p. 39 figs., 17 tables, 70 refs., 8 eqs. **DWB**—Elements of thermal balance are computed for 12 stations on oceans and continents. The data used for the 6 continental stations are surface temperature, humidity, cloudiness, sunshine duration and soil (as well as snow) temperature. The effect of snow cover on the thermal balance is analyzed especially for the stations Potsdam (Germany), Sodankylä (Finland), Irkutsk (U.S.S.R.) and Eismitte (Greenland). General values of the albedo of various surfaces are listed on p. 6, including amounts of 81 −85% for fresh snow and 42–70% for old snow. *Subject Headings:* **1. Snow cover effects on thermal balance 2. Thermal balance of earth's surface.**—*G.T.*

7H–35 551.578.46:551.524

Brooks, Charles F., **Snow favors cold and fair weather.** *Blue Hill Meteorological Observatory, Blue Hill Notes*, No. 6, Jan. 15, **1940.** [2 p.] **DWB**—Describing the weather development of the winter 1939/40, the author comments on a situation in which the southern part of the eastern U. S. was covered with snow while the northern part remained snow-free. With clear weather the average temperature was about 9 degrees high north of the snow belt than in the snow-covered area, as could be expected "by virtue of the insulating and reflecting qualities of the snow." *Subject Headings:* **1. Snow cover effects on weather 2. Temperature over snow surface 3. Eastern U. S.**—*G.T.*

7H–36 551.521:551.578.46

*Shpakovskaia, R. N., **Radiatsionnyĭ balans bukhty Tiksi.** [Radiation balance of Tiksi Bay.] *Problemy Arktiki*, No. 6:28–39, **1940.** 6 figs., 12 tables, refs. **DLC**—Data of direct, diffuse and outgoing radiation at Tiksi Bay for 1935–1938 are tabulated and discussed. Albedo measurements were in good agreement with data from other polar stations. Albedo values ranging from 86% for months with fresh snow cover to 30% for summer months without snow were used to calculate the radiation balance. An albedo value of 80% was used during the snow-melting period. The radiation balance was negative for the region during Oct.–May. The total annual radiation balance was equal to an average of 1.38 kg.cal. *Subject Headings:* **1. Radiation climate of Tiksi Bay 2. Albedo of snow 3. Tiksi Bay.**—*S.I.P.R.E. abstract.*

1941

7H–37 551.579.2

Bernard, Merrill and Wilson, Walter T., **A new technique for the determination of heat necessary to melt snow.** *American Geophysical Union, Transactions*, 22:178–181, Jan. **1941.** figs., table. **DLC**—Description of the procedure for determining the quantity of snow melting heat, devised by the U. S. Weather Bureau. The snow sample is put into a calorimeter with a known quantity of hot water, and the difference between the initial and final volumes of water and temperature are measured. *Subject Heading:* **1. Snow melt thermodynamics.**—*N.T.Z.*

7H–38 551.579.2

Church, J. E., **The melting of snow.** *Central Snow Conference, Michigan State College, Lansing, Dec. 11–12, 1941, Proceedings*, pub. **1942.** p. 21–32. photos, tables. **DLC**—The mechanism of snow melting and the various factors affecting it are discussed on the basis of findings of the author and other investigators. Details of the effects of heat penetration into snow, atmospheric humidity, chinook winds, rain, insolation and radiation (also its modification by interception by forests),

and earth warmth upon snow melt are considered, with general quantitative values for the contribution of each of these factors under different conditions. *Subject Heading:* **1. Snow melt thermodynamics.**—*G.T.*

7H–39 551.521.32:551.578.4

*Wexler, H., **Observations of nocturnal radiation at Fairbanks, Alaska, and Fargo, N. Dak.** *Monthly Weather Review, Supplement* No. 46, **1941.** 21 p. 10 figs., 5 tables, refs. **DLC**—Outgoing radiation measurements made during the winters 1936/37 and 1937/38 at Fairbanks, Alaska and Fargo, N. Dak., by means of Abbot-Aldrich melikerons (instrument and method described) are reported and discussed. The outgoing radiation values obtained are arranged by cloudiness values and tabulated along with local time, amount and kind of cloudiness, wind direction and velocity, and snow cover depth, character of top layer and temperature. *Subject Headings:* **1. Snow cover radiation 2. Nocturnal radiation data 3. Fairbanks, Alaska.**—*G.T.*

1942

7H–40 551.578.46:551.525

Shimanovskiĭ, S. V., **Vliianie pokrytiia na teplovoĭ rezhim grunta.** [The effect of cover on the thermal conditions of the ground.] (In: Akademiia Nauk SSSR. Institut Merzlotovedeniia. Iakutskaia Nauchno-issledovatel'skaia Merzlotnaia Stantsiia, **Issledovanie vechnoĭ merzloty v Iakutskoĭ Respublike,** pub. Yakutsk, 1942– Vol. 1:44–51, **1942.** tables.) **DLC**—Soil temperature was measured to a depth of 5 m to study the effect of snow cover on the thermal conditions of the ground. The average temperatures were about 2° higher at 1 m depth and about 0.7° higher at 5 m under cover. *Subject Heading:* **Snow cover effects on soil temperature.**—*N.T.Z.*

7H–41 551.579.2

Wilson, Walter T., **Some factors in relating the melting of snow to its causes.** *Central Snow Conference, Michigan State College, Lansing, Dec. 11–12, 1941, Proceedings,* pub. **1942.** p. 33–41. 6 figs., 15 refs. **DLC**—The problem of snow melt is reviewed in three sections: 1) Heat supply and transfer rates and their measurement; 2) snow melting rates and 3) relating snow melting to heat transfer. Diagrams showing snow melt and runoff as related to degree days are presented. Wet-bulb temperature as a measure of turbulent exchange of heat is discussed and the close relationship between these factors illustrated graphically. *Subject Heading:* **1. Snow melt Thermodynamics.** —*G.T.*

1946

7H–42 551.573:551.525.2:551.578.46

Häfelin, J., **Der Wasseraustausch zwischen Luft und Schneeoberfläche im Hochgebirge.** [Water exchange between air and snow surface in high mountains.] *Schweizerische Naturforschende Gesellschaft, Verhandlungen,* 126:96–97, **1946.** **DLC**—Brief report of investigations conducted on the Jungfraujoch in which measurements of the snow surface temperature and of the humidity and temperature of the air were taken and used for evaporation determinations. (*Same item as* K–137, Nov. 1950, *MAB.*) *Subject Headings:* **1. Evaporation of snow 2. Jungfraujoch, Switzerland.** —*H. P. Kramer.*

7H–43 551.578.46:551.501.9:551.579.2

Spengler, O., **Issledovanie snegotaianiia na Valdaĭskoĭ gidrologicheskoĭ stantsii G.G.I.** [Snow melt investigation at the Valdai Hydrological Station.] *Meteorologiia i Gidrologiia,* No. 2:80–81, **1946.** **DWB**—An outline of the observational program undertaken in the spring of 1946 at the Valdai hydrologic station of the G.G.I. under the supervision of P. P. Kuz'min. The basic physical processes of snow melting so vital to spring flood forecasting are investigated by means of actinometric, meteorological, snow sampling and hydrology measurements conducted for the purpose of determining the radiation balance, heat exchange, evaporation and water balance of the snow cover. Observations are made eight times a day with snow actinometers or albedometers. Light penetration measurements are made with selenium photocells and under-snow pyranometers. Temperature and humidity gradients at 20 and 200 cm, and wind at 20, 60 and 200 cm, snow depth and temperature, soil temperature, etc. are made with recording instruments and mercury thermometers. *Subject Headings:* **1. Snow research stations 2. Snow research equipment 3. Valdai Hydrologic Station, U.S.S.R.**—*M.R.*

1948

7H–44 551.573

Abramovich, D. I., **Elementy rezhima rechnogo stoka v zavisimosti ot sootnosheniia tepla i vlagi.** [Elements of river runoff depending upon the relation between heat and moisture.] *Prob-*

lemy Fizicheskoĭ Geografii, Moscow, 13:110–121, **1948.** 2 tables, map, 10 refs., eqs. **DLC**—The relationship between evaporation and thickness of layer of snow or of water, from whose surface evaporation is proceeding, is discussed; Voeĭkov's concept of "evaporability" is formulated as the evaporation of a layer of snow or water during a given time. The evaporating layer is calculated by the formula $E = 0.55\ D_A^{0.8}(1+0.125W)$ in which E =evaporating layer of water in mm; $D_A^{0.8}$ =atmospheric moisture deficit in mm at 2 m above ground in shelter; W =wind velocity in meters. (*Same item as* K–153, Nov. 1950, *MAB.*) *Subject Heading:* **1. Evaporation of snow.**—*I.L.D.*

7H–45 551.578.46:551.525

Kohn, M., **Über den Einfluss einer Schneedecke auf die Bodentemperaturen.** [On the influence of snow cover on soil temperature.] *Wetter und Klima*, 1:303–306, Sept./Oct. **1948.** fig., table, refs. **DLC**—Measurement of soil temperatures in the Alps (1300 m) were carried out using thermocouples, placed in glass pipes. Soil temperatures were above 0°C in soil without snow cover, and below freezing point under snow cover. *Subject Headings:* **1. Thermal properties of snow cover 2. Snow cover effects on soil temperatures.**—*N.T.Z.*

7H–46 551.521.14:551.578.46

Pleshkova, T. T., **Al'bedo zemnykh obrazovaniĭ.** [Albedo of ground formations.] *Priroda*, Moscow, 37(10):44–49, **1948.** 2 figs., 3 tables, diagrs., 12 refs. **DLC** -Albedo values reported for different surfaces by various authors are reviewed. For snow albedo, values between 94 and 45% have been reported, depending on purity and dryness. *Subject Heading:* **1. Albedo of snow.**—*G.T.*

7H–47 551.578.46:551.582

Rikhter, G. D., **Snezhnyĭ pokrov kak geograficheskiĭ faktor.** [Snow cover as a geographic factor.] *Vsesoiuznyĭ Geograficheskiĭ S"ezd, 2nd, Leningrad, 1947, Trudy*, 1:298–305, **1948.** table, foot-ref. **DLC**—Also his: **Vliianie snezhnogo pokrova na klimat.** [Influence of snow cover on climate.] *Akademiia Nauk SSSR. Institut Geografii, Trudy*, 40:10–18, **1948.** tables, 18 refs. (Unchecked)—The snow cover on the earth's surface provides an insulating layer between the ground and the atmosphere, characterized by low heat conductivity and low gas and light absorption. These properties affect the heat and gas exchange between the ground and the atmosphere and create a unique regime within the snow cover. The snow cover reflects from 80 to 94% of solar radiation, while the albedo of exposed ground varies from 10 to 30%. This reflectivity lowers the snow surface temperature below that of the ground and air and leads to temperature inversions. The snow cover affects the humidity of the air, wind velocities, cloudiness, and fog occurrence. The hydrological processes associated with snowfall are reviewed. 50 to 100% of the annual runoff is attributed to snow. *Subject Heading:* **1. Snow cover effects on climate.**—*S.I.P.R.E. abstract.*

7H–48 551.579.2:551.588.6

Rutkovskiĭ, V. I., **Klimaticheskaia i gidrologicheskaia rol' lesa.** [Climatic and hydrological influences of forests.] *Vsesoiuznyĭ Geograficheskiĭ S"ezd, 2nd, Leningrad, 1947, Trudy*, 2:387–405, **1948.** 5 figs., 3 tables, 19 refs. **DLC**—Influences of forest on precipitation, evaporation and runoff as well as on soil temperature and moisture are discussed. More than 2000 snow surveys carried out in European U.S.S.R. showed an important relationship between forests and snowmelt. The snow melting rate in a field was 16 mm/day, in a spruce forest it was 5 mm, and was not more 10 mm/day under foliage. *Subject Headings:* **1. Snow melt rate 2. Forest influences on snow melt 3. Forest climatology.**—*N.T.Z.*

7H–49 551.521.32:551.578.46

Yosida, Zyungo, **Absorption of sunbeams by snow layer.** *Low Temperature Science*, 4:17–26, **1948.** 2 figs., 2 tables, 4 refs., 3 eqs. In Japanese; English summary p. 25–26. **DLC**—Two experiments are described. In the first the effect of scattered earth upon heat absorption by a snow layer was analyzed (90% of the heat absorbed by the soil particles was transmitted to the snow). The second experiment revealed the heating effect of light penetrating into a snow cover. *Subject Headings:* **1. Heat exchange in snow 2. Absorption properties of snow cover 3. Radiation penetration in snow.**—*G.T.*

7H–50 551.508.22:551.578.46

Yosida, Zyungo and Utumi, Takehiko, **Measurement of thermal radiation from the snow surface by a simple air thermometer.** *Low Temperature Science*, 4:1–10, 1948. 6 figs., table, 5 refs. In Japanese; English summary p. 10. **DLC**—An air-thermometer of simple design was constructed for the measurement of radiation. Two thin wall glass bulbs are connected by an oil U-tube manometer. One of the bulbs is inclosed in a vessel which is kept at a constant temperature while the other is exposed so that it may receive the radiation from the snow surface. The temperature

difference of air in the two bulbs gives the quantity of radiation which the exposed bulb receive... An experiment is described which was done for the purpose of determining the direct heat exchang... between the snow surface and the air over it. *Subject Headings:* **1. Snow cover radiation 2. Tem... perature over snow surface.**—*From authors' abstract.*

1949

7H–51 551.521.14:551.578.4...

Saito, R., **On the reflection of the snow surface.** *Meteorological Society of Japan, Journa...* 2nd Ser., 27 (6):169–174, June **1949.** 3 figs., 3 tables, 10 eqs. In Japanese; English summary p. (21... **DWB**—A theoretical analysis of reflection from crystals constituting the surface of a snow cove... leads to the conclusion that reflection of light from a snow surface is strongest in a horizontal directio... away from the incident light rather than at an angle which would be expected from a plane surface... Reduction of reflection on account of surface unevenness is also calculated. Theoretical result... are in agreement with photometric measurements. *Subject Heading:* **1. Angular reflectivity of snow...** —*G.T.*

1950

7H–52 551.578.46:551.588....

Dmitrieva, N. G., **Raschet plotnosti snezhnogo pokrova po meteorologicheskim dannym...** [Calculation of snow-cover density using meteorological data.] *Meteorologiia i Gidrologiia*, No. 2... 39–44, Oct. **1950.** 2 figs., 2 tables, 6 refs., 4 eqs. **DLC.** Translation by N. T. Zikeev as *U. S... Snow, Ice and Permafrost Research Establishment, SIPRE Translation*, No. 24, Jan. **1954.** 4 p... 2 figs., 2 tables, 6 refs. **DWB**—Analyzing snow density changes in wind protected forest areas, i... was found that the increase in snow density (P) above the initial density P_0 (0.15–0.16) is $K\sqrt{\Sigma\theta}$... with $K = 0.007$ for $P < 0.26$ and $K = 0.002$ for $P \geqslant 0.26$, where $\Sigma\theta_t$ is the sum of positive daily tem... perature means. The effect of wind was studied for areas without thaw weather in the winter... The increase in density was found to be $0.0024\ \tau_v$; where τ_v is the number of days with wind velocity... $\geqslant 6$ m/sec. Agreement with data used for the analysis and a further verification was good. (*Same item as* 3.7–167, July 1952, *MAB.*) *Subject Headings:* **1. Snow cover density 2. Forest influences on snow cover 3. U.S.S.R. I. Zikeev, N. T.** (*trans.*).—*A.A.*

7H–53 551.578.46(436...

Steinhäusser, H., **Über die Bewertung der Schneeverhältnisse alpiner Orte auf Grund der... Abhängigkeit der Andauer der Schneedecke, der mittleren maximalen Schneehöhe und ihren... Eintrittszeit von der Seehöhe.** [Evaluation of Alpine snow conditions on the basis of the de-... pendence of snow-cover duration, mean maximum snow depth and its date of occurrence, on eleva-... tion.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2 (1–2):120–128, **1950...** 2 figs., 4 tables, 9 refs., 4 eqs. German, English and French summaries p. 120–121. **DWB**—Average... data of maximum snow depth in Alps increases upwards (with local irregularities) from Jan. 20 at... 200 m, Feb. 11 at 1000 m, Feb. 14 at 1250 m and May 29 at 3000 m. Correlation with height .77,... with annual precipitation only .35, but with proportion falling as snow .76. Very similar relations... are shown by maximum depth of snow. The "normal altitude" is an index of duration, mean... maximum depth and its date of occurrence. (*Same item as* 2.3–138, March 1951, *MAB.*) *Subject... Headings:* **1. Snow cover 2. Altitude effects on snow cover 3. Austrian Alps.**—*C.E.P.B.*

1951–1952

7H–54 551.578.46:536.24:69...

Reidat, Rudolf, **Bauwesen und Wetterdienst.** [Architecture and weather service.] *Der... Deutsche Holzbau*, Berlin, No. 7/8, **1951.** 11 p. 12 figs. Foreword by Dr. Dammann. Abstracted... from reprint. **DWB**—Includes a graph showing heat conductivity for various types of snow (from... fresh snow to glacier ice) and comparable conductivities of different building materials. (For... fuller abstract, *see* 3.8–172, Aug. 1952, *MAB.*) *Subject Headings:* **1. Thermal conductivity of snow... 2. Building materials.**—*G.T.*

7H–55 551.501:551.578.46

*U. S. Corps of Engineers. **Snow Investigations, Hydrometeorological log of the Central Sierra... Snow Laboratory 1945/46** [to] **1951/52 water year.** 7 v. Also: . . . **Upper Columbia Snow... Laboratory, 1945/46** [to] **1950/51 water year.** 6 v. and: . . . **Willamette Basin Snow Laboratory, 1947/48** [to] **1950/51 water year.** 2 v. Mostly tables, figs. Some issued as *U. S. Corps of En-... gineers and U. S. Weather Bureau, Cooperative Snow Investigations, Technical Report*, (No. 5, 7, 17, 18, 20–26). **DWB**—These large reports are a good source of basic data. They contain in addition

o the tables of daily values of all the recorded elements and a composite graphical presentation of the data, numerous maps, charts and photographs showing equipment exposures and snow courses and a discussion of the sites and the organization, laboratory investigations and processing of data. Radiation, air temperature, dew point, wind pressure, precipitation, snowpack data, ground water level, streamflow, soil moisture data, etc., are included in tables and discussion. Hourly values are included in most cases. *Subject Headings:* **1. Snow surveys 2. Climatic data 3. Central Sierra Snow Lab. 4. Upper Columbia Snow Lab. 5. Willamette Basin Snow Lab. 6. California. I. U. S. Weather Bureau. Cooperative Snow Investigations.**—*M.R.*

1953

7H–56 551.578.46:551.588.6

*Dantov, R. K., **Vliianie lesozashchitnykh polos na glubiny snegovogo pokrova i promerzanie pochvy.** [Influence of forest belts on the depth of snow cover and soil freezing.] *Akademiia Nauk SSSR, Doklady*, 89(3):555–556, **1953.** table. **DLC**—Measurements of snow depth and density were made in the winter of 1949–50 in two forest belts and to a distance of 250 m. Noticeable influence of forest belts on snow cover reached to 100 m when the depth of snow cover was 128–155 cm in a forest belt, it was only 45–46 cm 250 m distant. *Subject Headings:* **1. Snow cover depth 2. Soil freezing 3. Forest influences on snow cover.**—*N. T. Zikeev.*

7H–57 551.521.3:551.311.12

Howell, Wallace E., **Some measurements of ablation, melting and solar absorption on a glacier in Peru.** *American Geophysical Union, Transactions*, 34(6):883–888, Dec. **1953.** 6 figs. **DLC**—Ablation, melting and absorption of solar radiation were measured on a glacier of the Nevado de Huagaruancha in the Eastern Cordillera of Peru. From the results it is inferred that 1) evaporation amounts to about 5% of the melt; 2) the amount of melt is determined largely by the amount of solar radiation absorbed between onset of thaw in the morning and onset of diurnal cloudiness in the afternoon (with average cloudiness, the melt is about 1 cm daily, rising to 1.5 cm on unusually sunny days); and 3) darkening of the snow increases melt by increasing absorption of radiation and lengthening the period of melting. (*Same item as* 6.2–171, Feb. 1955, *MAB.*) *Subject Headings:* **1. Glacial ablation 2. Absorption by glaciers 3. Ice melting 4. Peru.**—*Author's abstract.*

7H–58 551.578.46:551.588.6

*Kittredge, Joseph, **Influence of forests on snow in the Ponderosa-sugar pine-fir zone of the Central Sierra Nevada.** *Hilgardia*, Berkeley, Calif., 22(1):1–96, March **1953.** 92 figs., 31 tables, 43 refs. **DWB, DLC**—This study aims at determining the sizes and densities of forests that are most effective in favoring the accumulation of snow, in minimizing losses by evaporation and in retarding and prolonging the melting period. The observations which comprise more than 20,000 records were made from Dec. to May or June for seven seasons (1934–38 and 1940–41) in the Stanislaus National Forest. Snow samples were taken at 100 stations equipped with composition boards, which were supplemented with 8-in. rain gages without funnels in each of the ten different cover types. Evaporation was measured by means of aluminum pans. The data are presented by means of graphs, tables and regression equations. The data cover density of snow, snow accumulation, interception, total snow on the ground, depth of snow, density of total snow, water equivalent of total snow on the ground, evaporation from snow, duration and disappearance of snow cover and melting of snow. The suggestions, obtained from these studies, for improving the amount and timing of the yields of water from snow are outlined. (*Same item as* 6.4–296, April 1955, *MAB.*) *Subject Headings:* **1. Forest influences on snow accumulation 2. Snow data 3. Snow melt 4. Central Sierra Nevada, Calif.**—*I.L.D.*

7H–59 551.579.2:551.588.6

U. S. Corps of Engineers. Snow Investigations, **Heat exchange and melt of late-season snow patches in heavy forest.** Its *Research Note* [No. 11], May 15, **1953.** 19+2 p. 12 plates (fold.), 21 eqs. **DWB**—An analysis is presented of observations in mid-July of a continuously melting snow patch in a dense coniferous forest during five days of clear, calm weather. Each heat-supply component is evaluated from measurements (and supplementary estimates) of longwave and shortwave radiation, of condensation, and of air temperature close to the snow. Each component (except solar radiation) is then formulated in terms of air temperature and air moisture at the height of normal measurement. The influence of the forest on longwave and shortwave radiation is considered, and factors expressing those effects are obtained. The study indicates that, under these conditions, more than $\frac{1}{2}$ of the melt near the snow surface is due to longwave radiation, about $\frac{1}{5}$ to convective-conductive transfer of heat from the air, $\frac{1}{7}$ to latent heat of condensation and the remainder to shortwave solar radiation. *Subject Headings:* **1. Snow melt in forests 2. Snow melt thermodynamics. I. Arnold, B. A.**—*From author's abstract.*

7H–60 551.57

*U. S. Corps of Engineers. Snow investigations, **Lysimeter studies of clear weather snow m at an unforested site.** Its *Research Note*, No. 17, Dec. 15, **1953.** 24 p. 3 tables, 3 plates (fold 10 refs., eqs. **DWB**—Methods of computing runoff from snow melt are examined and compare Experimental data are obtained from a model drainage basin located in an unforested site at a snc laboratory equipped with meteorological recording instruments. (Lower meadow of Central Sier Snow Lab., Spring 1952.) Analyses are presented of the thermal-budget method of computi snow melt and various temperature-index methods in common use for the same purpose. A vantages and disadvantages of each method under varying conditions are discussed. Recommend tions are made for future observations to more rigorously determine the causes of snow melt and improve methods for its estimation. (*Same item as* 5.8–220, Aug. 1954, *MAB.*) (For later repo on same research *see* item 7G–218, July 1956, *MAB.*) *Subject Headings:* **1. Snow melt runc 2. Snow melt 3. Experimental hydrology 4. Central Sierra Nevada, Calif. I. Hildebrand, C. II. Pagenhart, T. H.**—*Authors' abstract.*

1954

7H–61 551.578.46:551.521.

Budyko, M. I.; Berliand, T. G. and Zubenok, L. I., **Teplovoĭ balans poverkhnosti zemli.** [He balance of the earth's surface.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geogr.*, No. 3:17–41, 195 10 figs., 3 tables, 34 refs., 10 eqs. **DLC**—Also abridged Polish version: Molga, M., **Bilans ciepl powierzchni ziemi.** *Przeglad Meteorologiczny i Hydrologiczny*, Warsaw, 8(1):75–90, **1955.** 5 figs table, 7 refs., 10 eqs. **DWB**—Thermal and radiation balance of the earth is calculated from tot radiation, albedo and various types of heat exchange. Albedo values assumed for snow are: 80% for permanent cover in high latitudes; 70% for permanent cover in temperate latitudes and 45% for intermittent cover. *Subject Headings:* **1. Heat balance of earth's surface 2. Albedo of snow** —*G.T.*

7H–62 551.578.4

Gerdel, R. W. (*SIPRE, Wilmette, Ill.*), **The transmission of water through snow.** *American Geophysical Union, Transactions*, 35(3):475–485, June **1954.** 10 figs., table, refs. **DLC**—A instrument which makes use of the difference in the dielectric constants of ice and water was con structed and used to detect small changes in the liquid water present in a snow pack. The velocit of a moving front of water through snow and the approximate residual storage of liquid water in th snow pack were measured by means of this instrument. Water transmission rates were found t vary from 0.9 to 24.0 inches of snow per minute. The higher rates were associated with high densit snow. The residual storage of liquid water in the snow varied between 0.7 and 5.5% with the ma jority of the measurements showing a residual storage of less than 2% free water or about 0.1 inc of free water per foot of snow. (*Same item as* 6.2–274, Feb. 1955, *MAB.*) *Subject Heading* **1. Water content of snow pack 2. Water transmission through snow.**—*Author's abstract.*

7H–63 551.578.4

*Panfilov, IA. D., **O konstruktsii polezashchitnykh lesonasazhdeniĭ.** [On the structure c forest shelter belts.] *Agrobiologiia*, Moscow, 1(85):113–126, Jan./Feb. **1954.** 9 figs., table **DLC**—Long period investigation in the forest-steppe and forest region of the U.S.S.R. indicated th influence of the structure of forest protective belts on the formation of snow cover around th belts. Dense belts provide the most uneven distribution of snow cover around belts, with maximum snow deposit in front of belts. Illustrations and graphs show the peculiarity of snow distribution depending on belt structure. *Subject Headings:* **1. Snow cover distribution 2. Shelter belt effect on snow cover.**—*N.T.Z.*

1955

7H–64 551.578.4

Akademiia Nauk SSSR. Institut Geografii, **Voprosy izucheniia snega i ispol'zovaniia ego narodnom khoziaĭstve.** [The study of snow and its application to the national economy.] Moscow Izdat. Akademii Nauk SSSR, **1955.** 175 p. figs., tables, eqs. bibliog. at end of each chapter **DLC**—The following papers are contained in this collection:

Rikhter, G. D., **Ispol'zovanie snega v narodnom khoziaĭstve i zadachi ego izucheniia.** [Utiliza tion of snow in the national economy and the problems of its investigation.] p. 5–24.

Sulakvelidze, G. K., **Nekotorye fizicheskie svoĭstva snezhnogo pokrova.** [Some physica properties of the snow cover.] p. 24–54.

Shimanovskiĭ, S. V., **Nabliudeniia nad temperaturnym rezhimom snezhnogo pokrova v Iakutske Igarke i Podmoskov'e.** [Observation of the temperature regime of snow cover in Iakutsk, Igarka and near Moscow.] p. 55–72.

Chekotillo, A. M., **Temperaturnaia inertsiia pochvy v zimnee vremia.** [Temperature inertia of the soil in winter.] p. 73–97.

Mel', M. I., **K postanovke nabliudenii nad snezhnym pokrovom.** [Organizing snow cover observations.] p. 98–111

Shul'gin, A. M., **O kharaktere raspredeleniia snezhnogo pokrova na poliakh.** [Distribution of snow cover in fields.] p. 112–136.

Shul'gin, A. M., **Dinamika snezhnogo pokrova i vozmozhnost' sozdavaniia ego ustoĭchivosti v kontinental'nykh raĭonakh.** [Dynamics of snow cover and the probability of its stabilization for continental regions.] p. 137–145.

Gongadze, D. N., **Nekotorye voprosy dinamiki snezhnykh lavin.** [Some problems in the dynamics of avalanches.] p. 146–151.

Galakhov, N. N., **Vliianie lesoobrazuiushchikh porod na taianie snezhnogo pokrova.** [Influence of forests on the melting of snow cover.] p. 152–175.

The first article deals with the importance of snow in agriculture and commerce, general problems of snow cover, the study of its physical properties, effects on climate and human activities, etc. The other articles take up the specific studies of the radiation and temperature regime of snow cover and their influence on soil temperature, observation techniques, dynamics of snow drifting, etc., avalanches, and snowmelt in forests. The articles are based on research performed in the USSR but do not neglect some of the basic work done abroad. There is a wealth of original data on snow temperatures, etc., mostly in the form of graphs and cross sections, but also in tabular form. Theoretical aspects are treated in detail in most of the articles. *Subject Headings:* **1. Snow cover properties 2. Snow research.**—*M.R.*

7H–65 551.579.2:551.588.6

Goodell, B. C. and Wilm, H. G., **How to get more snow water from forest lands.** *U. S. Dept. of Agriculture, Water: the Yearbook of Agriculture,* 1955:228–234, pub. **1955.** 8 refs. **DA, DWB**—Evaporative losses of snow intercepted by coniferous forests are very heavy, amounting to as much as 29%, as deduced from increase in snow pack in a Colorado test area where lodgepole pine forests were *cleared*, and 20% when merely *thinned*. In another Colorado experiment 30% more snow was accumulated under aspen (deciduous) than under lodgepole pine. Similar results were found in California (dense evergreen) by KITTREDGE, and in New Hampshire by M. L. MAULE. As snowfall increases, evaporative losses from intercepted snow increase (up to a certain point, when no more evaporation is possible). Evaporative losses from snow pack, however, are less under a forest canopy than in open. Forests also reduce snow melt and make peak runoff earlier. Clearing increased streamflow about 16%. The effects vary from place to place, and are very complex. *Subject Headings:* **1. Snow interception by forests 2. Evaporation of snow 3. Streamflow increase 4. Colorado.**—*M.R.*

7H–66 551.578.46

Ishida, Tamotsu and Shimizu, Hiroshi, **Determination of the air flow resistance through snow layer, Pt. 1.** *Low Temperature Science, Ser. A, Physical Sciences, Sapporo, Japan,* 14:33–42, **1955.** 9 figs., 3 tables, 7 refs., 9 eqs. In Japanese; English summary p. 41–42, **DWB**—A reliable method for measuring and studying the flow of air through a snow layer was developed. The resistance encountered by air in a stationary flow through a snow layer was determined experimentally on several types of snow. It is found that the flow of air through snow closely resembles that through granular porous materials, such as sand. The specific surface and the mean hydraulic diameter of the ice particles composing snow are suggested as useful characteristics representing the properties of snow, such as snow density. *Subject Headings:* **1. Air flow through snow cover 2. Snow cover structure.**—*From authors' abstract.*

7H–67 551.579.2

Ishii, Sachio (*Sapporo, Japan*), **On some mechanisms of snow-melt.** *Researches on Snow and Ice,* Tokyo, No. 2:53–61, Jan. **1955.** 4 figs., 2 tables, 9 refs., 4 photos, eqs. In Japanese. **DWB**—The process of snow melting and the melting rate are discussed, considering structure of the snow cover (snow sampler is described and illustrated; photomicrographs of arrangement of crystals in various types of snow cover are presented), albedo of snow and amount of heat supply (degree-days). *Subject Headings:* **1. Snow melt 2. Albedo of snow.**—*G.T.*

7H–68 551.578.46:551.573

Kern, Helmut, **Schneeverdustungsmessungen in Obernach.** [Snow evaporation measurements at Obernach.] *Deutsches Gewässerkundliches Jahrbuch, Besondere Mitteilungen,* Coblenz, No. 12:69–72, **1955.** fig., 2 refs. **DWB**—Snow evaporation at Obernach, Bavaria, has been measured with interruptions since 1937. The measuring device (a scale in a cellar with open ceiling,

supporting the snow cover above) is described and illustrated. Average evaporation at Oberna during a winter is found to be 20 mm, i.e. only 7% of the average total winter precipitation. TI value agrees with results obtained by M. de Quervain on Weissfluhjoch. It appears that the cc tribution of evaporation from the snow cover surface to the ablation of the snow cover has be overestimated in the past. *Subject Headings:* **1. Evaporation of snow 2. Snow evaporation measur ment 3. Obernach, Germany.**—*G.T.*

7H–69 551.57

Kojima, Kenji (*Inst. of Low Temp. Science, Sapporo, Jap.*), **Some experiments on snow-me** *Researches on Snow and Ice*, Tokyo, No. 2:37–51, Jan. **1955.** 9 figs., 6 tables, 13 refs., 5 eqs. Japanese; English summary p. 50. **DWB**—Instruments and methods used in observing snow m mechanism are described and results reported. Melting rate of snow is found to be $w = (0.00$ $+0.017v)\theta$, where v = velocity of air current and θ = air temperature. A radiation absorpti coefficient of 0.09 was obtained for snow by a thermometric as well as optical method. Temperat loss of water (initial temperature: 1 to 10°C) passing through snow was also measured; 0°C reached almost as soon as the water penetrates into the snow cover. *Subject Headings:* **1. Snow m rate 2. Heat absorption of snow.**—*G.T.*

7H–70 551.57

Kozima, Chyûsaburo. **On the mechanisms of snow thawing—mainly by radiation.** *Researc on Snow and Ice*, Tokyo, No. 2:87–95, Jan. **1955.** 4 figs. 7 tables, 7 refs., 5 eqs. In Japanes English summary p. 95. **DWB**—Snow thawing experiments conducted indoors gave 0.005 $cm^2hr.°C$ as the amount of snow melted, with variations of ± 0.001 $g/cm^2hr.°C$, depending on t condition of the snow surface. Effects of wind and of soil particles on the melting rate are discusse *Subject Heading:* **1. Snow melt rate.**—*Based on author's abstract.*

7H–71 551.57

Magono, Chôji and Kumai, Motoi, **Calorimetrical investigation of the mechanism of snow m by soil scattering.** *Researches on Snow and Ice*, Tokyo, No. 2:63–79, Jan. **1955.** 20 figs., 16 tabl 19 refs., 4 photos, 7 eqs. In Japanese; English summary p. 78. Also: Inoue, Naoichi, **An empiric formula for snow-melt.** *Ibid.*, p. 81–86. 4 figs., 2 tables, 4 refs., 5 eqs. In Japanese. **DWB** The following relation is established between the amount of heat passing through the snow surfac neglecting heat from the earth's surface: $\alpha(S.\sin.h + D) + C = m + e$; where α = absorptive power snow surface, D = sky radiation, C = calories transmitted from air to snow surface, m = calori expended on snow melt and e = calories expended on evaporation from snow surface. Results field measurements of all these quantities (except C) are presented. A formula for snow me rate as a function of soil particle scattering is also suggested; the highest rate of snow melt is fou to occur with 2 l of earth on each m^2 snow surface; 0.1 l/m^2 is found to be the most economical amoun *Subject Headings:* **1. Snow melt rate 2. Snow melt thermodynamics.**—*Based on authors' abstract.*

7H–72 551.508.72:551.57

Shidei, Tsunahide, Ban, Sadao and Enjyu, Kayoko, **Temperature, wind and snow-melt.** *Re searches on Snow and Ice*, Tokyo, No. 2:97 104, Jan. **1955.** 8 figs., 2 tables, 6 refs., eq. In Japane **DWB**—An experimental arrangement (consisting essentially of an evaporation pan, a heater a a blower) for laboratory measurement of snow evaporation rate in conjunction with air flow a temperature, is described and illustrated. Results of the measurements are tabulated and grap ically presented. *Subject Headings:* **1. Snow laboratory equipment 2. Snow evaporation measur ment.**—*G.T.*

7H–73 551.579:0

International Union of Geodesy and Geophysics. Association of Scientific Hydrolog **[International Bibliography of Hydrology], 1934?**—Beginning date according to individual memb country. Variation in periodicity and regularity, as well as format. **DLC, MH-BH** and **DW** have scattered issues for various countries. These bibliographies are being issued by individu countries in accordance with a recommendation of I.U.G.G. They contain references to curre hydrologic literature published in the country reporting. The subject arrangement in each iss follows the general pattern (9 sections) devised by the recommending agency. Bibliographies a available for Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Czechoslovakia, Denmar Estonia, France, Germany, Great Britain, Hungary, Ireland, Italy, Japan, Latvia, Lithuani Morocco, Netherlands, Norway, Poland, Portugal, Sweden, Switzerland, Spain, South Africa a the United States. The number of items in each issue ranges from 4,500 references (U.S.A. a Canada, 1941–50) to not much more than a dozen for some issues. References on snow cover m be found in Section I (hydrometeorology) and IV (snow, ice and glaciers) of some of the countri

ctively engaged in snow research (U.S.A., Canada, Italy, Switzerland, etc.) (For fuller information, e 6A–78, Jan. 1955, *MAB*. *See also* 6A–102 for Canada and U. S., 1941–1950; and 6A–85 for ermany.) *Subject Headings:* **1. Bibliographies on hydrology 2. Hydrology bibliographies 3. Bibography on snow.**—*G.T.*

7H–74 551.578.46

[Unannotated list of supplementary references on the micrometeorology of snow cover.]—

(1) Westman, J., **Beobachtungen über den Wasseraustausch zwischen der Schneedecke und er Luft im mittelschwedischen Tieflande.** [Observations on the water exchange between the now cover and the air in the central Swedish lowland.] *Medd. Hydrografiska Bryån*, 5:1–26, **1913.** llus., tables, 13 refs. SIP 7602

(2) Sverdrup, H. U., **Thermal properties of the snow covering.** *Christian Michelson's Institute f Science and Free Thought, Rept.* I, 3, **1931.** 15 p. SIP U4523

(3) Sverdrup, H. U., **The exchange of heat between a snow surface and the air.** *Christian Michelson's Institute of Science and Free Thought, Rept.* V, 3, **1935.** 27 p. 13 refs. SIP U4541

(4) Idumi, S., **Yuki no kosen tokaritsu.** [The transmissibility of solar radiation through snow over.] *Meteorological Society of Japan, Journal*, 2nd Ser., 14:92–93, Feb. **1936.** tables. English ummary p. (10). SIP 10099

(5) Oikawa, Shu, **Sekisetsu to ekunai kikō.** [Some hygienical notes on snow.] *Seppyo*, :9–11, **1940.** table. Engl. summary. SIP U3453

(6) Kudo, Kiyoshi, **Sekisetsu-chū no akarusa.** [Brightness within the snow cover.] *Seppyo*, :390–395, **1941.** tables, graphs, diagrs., 7 refs. Transl. available. SIP U3439

(7) Suga, Tarō, **Sekisetsu to kōsen to no kankei ni kansuru kenkyu. Shigaisen oyobi kashi osen no sekisetsumen ni okeru hansha-ritsu ryakuho.** [A study of light as affected by snow cover; he coefficient of reflection of ultraviolet and visible light at the snow surface; a brief report.] *eppyo*, 3:291–294, **1941.** illus., table, diagr. Transl. by Hope, E. R., *Defence Sci. Information ervice, Canada*, Feb. **9, 1953.** SIP U3445, U4728

(8) Löhle, F., **Absorptionsmessungen an Neuschnee und Firnschnee.** [Absorption measureents on fresh and firn snow.] *Gerl. Beiträge zur Geophysik*, 59:283–298, **1943.** tables, graph, iagr., 23 refs. SIP 11701

(9) Kirschmer, O. and Rimku, K., **Losses due to evaporation and melting of the Alpine snow over prior to spring thaw.** *FIAT Report*, No. 1008, Ser. 4, **1946.** 10 p. SIP 10500

(10) Trainor, Lynne E. H., **The spectral reflection and absorption of radiation by snow.** Saskatchewan Univ., Saskatoon, Thesis (M.A.), **1947.** 74 p. figs., tables, 35 refs. SIP 8851

(11) Kunii, Koji and Yamaouchi, Hideo, **Shigai-sen no sekisetsu toka ni tsuite.** [On the ransmission of ultraviolet light through the snow cover.] *Seppyo*, 10:112–115, **1948.** tables, raphs, 4 refs. SIP U3393

(12) Sapozhnikova, S. A., **Teplovoĭ balans deiatel'noĭ poverkhnosti v osnovnykh geograicheskikh zonakh SSSR.** [Heat balance of the active soil surface in the principal geographical ones of U.S.S.R.] *Vsesoiuznyĭ Geograficheskiĭ S"ezd, 2nd, Leningrad, 1947, Trudy*, 2:228–239, **948.** tables, 20 refs. SIP U5678

(13) Holland, J. D., **An objective method of forecasting maximum temperatures over snowovered terrain.** *Canada. Meteorological Div., Circular*, CIR-2197, TEC-131, Nov. 24, **1952.** p. 3 refs. SIP 7857

(14) Dewar, S. W., **Notes on Arctic weather phenomena.** *Canada. Meteorological Div., Circular*, CIR-2198, TEC-132, Nov. 24, **1952.** 13 p. SIP 7858

These items have been listed and indexed because of their importance, but have not been located r checked. Further information may be obtained by consulting the *SIPRE Bibliography* (*see tem* 7G–3, July 1956 *MAB*.). The SIPRE reference number is included at the end of each of the bove references.

PART III. REVIEWS OF RECENT IMPORTANT METEOROLOGICAL MATERIAL AND METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The references to reviews of new books or monographs and the contents of periodicals included in this section are for information only and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of publications, the pagination may be omitted.

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

Advances in Geophysics, Vol. 2, ed. by H. E. Landsberg. N. Y., Academic Press, 1955. 286 illus., bibliog. at end of each section. Price, $7.50. Review by Waldo E. Smith in *Scien* Wash., D. C., 123(3207):1085–1086, June 15, 1956. [*See* 6.7–1, July, 1955, **MAB** for abstract

Bourke, P. M. Austin: **Forecasting from weather data of potato blight and other plant diseas and pests.** *World Meteorological Organization*, [*Pub.*] No. 42 TP 16, *Technical Note*, No. 1 1955. 48 p. 6 figs., 2 diagrs., 116 refs. Review by K. Pejml in *Meteorologické Zprávy*, Prag 9(2):63–64, 1956.

Durov, S. A. and Fedorova, N. E.: **Istochniki ionno-solevogo sostava atmosfernykh osadkov SSS** [Sources of the ionic-saline composition of atmospheric precipitation]. [In] *Academiia Na SSSR, Doklady*, 103(4):663–665, 1955. 2 figs., table, 10 refs. Review by George V. Chiling in *American Geophysical Union, Transactions*, 37(2):193–196, April 1956.

Ewing, Maurice and Donn, William L.: **Theory of ice ages.** [In] *Science*, Wash., D. C., 123(3207) 1061–1066, June 15, 1956. 2 figs., 45 refs. Review in *Science News Letter*, Wash., D. C. 69(26):402, June 30, 1956.

Kimble, George H. T. and Good, Dorothy, (eds.): **Geography of the Northlands.** N. Y., John Wiley, 1955. 534 p. maps, illus. Review by N. L. Nicholson in *Economic Geograph* Worcester, Mass., 32(3):275–276, July 1956. [*See* 7.6–2, June 1956, **MAB,** for abstract.]

Linsley, Ray Keyes, Jr. and Franzini, Joseph B.: **Elements of hydraulic engineering.** N. Y. McGraw-Hill, 1955. 582 p. numerous figs., tables and bibliogs. Price, $9.00. Review b Walter T. Wilson in *American Geophysical Union, Transactions*, 37(3):334–335, June 195 [*See* 7.7–5, July 1956, **MAB,** for abstract.]

Repina, S. P.: **Nekotorye svoistva podvetrennykh vozdushnykh voln** [Some characteristics of le wind waves]. [In] Meteorologiia i Gidrologiia, No. 1, 1953. Review by N. V. Roze i *Meteorologiia i Gidrologiia*, No. 4:66, April 1956.

Riehl, Herbert: **Tropical meteorology.** N. Y., McGraw-Hill, 1954. 392 p. maps, diagrs., illus bibliogs. Price, $8.50. Review by Robert G. Stone in *Geographical Review*, N. Y., 46(3):448 449, July 1956. [*See* 5.8–8, Aug. 1954, **MAB,** for abstract.]

Saucier, Walter J.: **Principles of meteorological analysis.** Cambridge, University Press, 195 438 p. numerous figs., tables, refs., and eqs. Price 75 sh. Review by M. K. M. in *Weather* London, 11(6):203, June 1956. Review by J. M. Stagg in *Nature*, London, 177(4517):95 May 26, 1956. [*See* 7.3–7, March 1956, **MAB,** for abstract.]

U. S. Dept. of Agriculture: **Water: the Yearbook of Agriculture, 1955.** Wash., D. C., Govt. Prin Off., 1955. 751 p. illus., tables and bibliogs. throughout. Review by Peter C. Duisberg i *Science*, Wash., D. C., 123(3207):1085, June 15, 1956. [*See* 7.3–4, March 1956, **MAB,** fo abstract.]

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